Plants Used in Ethnoveterinary Medicine in Cows. A Review

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Abstract

Through the regulations CE.834/2007 and implementing rules CE 889/2008, regarding the organic production the treatment with antibiotics in livestock are extremely limited. Therefore plants can replace medicines in treatment of certain conditions. The plants used in ethnoveterinary medicine are varied depending on area, but this review refers to plants existing in Romania identical to those existing in other areas of the world, some being used only in certain areas, others in areal extended, but it can be a start for farmers to seek natural remedies. There are 66 plant species which belong to a large number of families, but most plants belong to the family *Asteraceae* (11 -16.66%), followed by species of family *Solanaceae* (6.06%) and family: *Malvaceae*, *Adoxaceae*, *Convolvulaceae*, *Euphorbiaceae*, *Fabaceae* with 3 species each (4.54%). Of the plants, 11 species (16.8%) are considered to be toxic and 18 (27.2%) potentially toxic but, have therapeutic effect in extremely small amounts. Regardless of the area, plants are used in the same treatments in different form.

Keywords: Cows, ethnoveterinary, plants, treatment

Introduction

Sri Balaji and Chakravarthi in a paper published in 2010, claim that the treatment of animals began with their domestication, ethnoveterinary knowledge having for purpose, maintaining healthy animals. The first documents dates with 2000 - 1800 years B.C, when the ancient indians realized the benefits brought by healthy animals (Kohli, 2015). With 1800 years before Christ, King Hamurabi of Babylon introduced a veterinary law, through which, were perceived, fees and charges for treatment of cows and donkeys (Selvaraju *et al.*, 2011).

With a tradition of over 5,000 years, India, is the country with the most sophisticated medical culture, farmers, using their knowledge in animal

treatment until nowadays (Mooventhan *et al.*, 2016).

Verma and Sing (2008), remember that, in ancient literature of India, there were over 500 plants that had medicinal uses and 800 used as remedies in indigenous systems of medicine.

Many knowledge about plant treatment has been lost with modern therapy (Selvaraju *et al.*, 2011), but, in developing country, often, the lack of medication and treatment of animals is precarious, therefore, ethnoveterinary medicine that is concerned with traditional care through the knowledge, skills, methods, practices and beliefs of animal health care, is the alternative (Moreki *et al.*, 2012).

After Wedson *et al.*, (2012), the main constraint in production increasing is related by the precarious animal health, which is why the promotion of ethnoveterinary medicine can be an economically efficient alternative (Krishna, *et al.*, 2005). Along with methods of care, healing and management of livestock, ethnoveterinary practice also take into account social practices, the way of integrating animals in farming system (Wanzala *et al.*, 2005).

In Europe, ethnoveterinary practices are quite rare, modern medicine taking the place of traditional practices, but these, have been preserved in the rural areas of the Mediterranean basin (González *et al.*, 2011). After Mayer *et al.* (2017), the knowledge and application of ethnoveterinary medicine is applied in 12 of the 37 countries of the European Community, but, between these countries there are quite remarkable differences (Romania, Spain, Italy and Albania). Similarities were found between ethnoveterinary medicine applied in Swiss and Italy, but the most investigated areas were those belonging to Italy, Spain and Turkey.

In ethnoveterinary medicine, parts of plants such as root, bark, stem, leaves, flowers, seeds are used in the form of infusion, decoction, ointment, powder, drops (Schmid *et al.*, 2012).

Sometimes the beneficial action comes from the plants considered toxic, which contain saponins, terpenoids, phenolic compounds, alkaloids, carotenoids, the effects of their administration being: antioxidant, anthelmintic, fight against metabolic disorders but, at the same time may have hepatotoxic, neurotoxic effect (Poutaraud *et al.*, 2017).

Although not all saponins have the same effects, are used in ethnoveterinary medicine due to biological effects: antibacterial, antifungal, antiviral, anti-inflammatory, anti-edemic, analgesic, antitussive and expectorant. The tannin of the plant by its pharmacological effects: astringent, antibacterial, antifungal, mucoprotective, antioxidant and enzyme inhibiting, is used to treat diarrhea, burns, but also in placental retention in cows (van der Merwe *et al.*, 2010).

The plants, some of them with toxic potential, present in spontaneous flora whose area of spreading is wide: Italy, Greece, Turkey, Romania: *Chelidonium majus* L., *Malva sylvestris* L., *Mentha*

pulegium L., *Sambucus nigra* L., *Thymus vulgaris* L., can be administered as decoction, ointment, in treatment of certain disorders and injuries in cows (Quave *et al.*, 2012).

Aim of the study

The aim of the paper was those to identify the species of plants which exists on the pastures, meadows from Romanian territory similar to those from other countries of the European community and parts of the world, which are or, can be used in ethnoveterinary treatments in cows by farmers especially those who are registered in the organic farming system and not only.

Plants used in ethnoveterinary medicine with multiple action in cow

The content in organic acids, resins and tannin of *Malva sylvestris* L. (mallow) indicates it as good natural remedy applied in case of wounds, abdominal pain, bloating, sprains, pneumonia, poisoning, administered as appropriate, in form of decoction (*per os*) or external application (Bullitta *et al.*, 2007).

A beautiful and feared plant, *Aconitum napellus* L. (queen of poisons), it is used in ethnoveterinary medicine in diseases such as: transport fever, acute changes, stress caused by castration, manipulation, weaning of animals (McCrory, 2012).

Castor bean (*Ricinus communis* L.) seeds contain about 50% oil, ricinin (alkaloid) and ricin, a very toxic glycoprotein, but, which at low doses has utility in treatment of constipation, dermatophilia, placental retention, or wound healing (Fitsum and Mekonnen, 2017).

Equisetum arvense (horsetail) is used during calving period to maintain the mineral balance (www.bionaturesanteanimale.fr).

After Davidović *et al.*, (2012) has immunostimulatory action and, curatively, serves as remedy in gastrointestinal disorders. The whole plant can be used to treat urinary problems (Viegi *et al.*, 2003).

Decoction of bark, flowers, adult fruits of viburnum (*Viburnum spp.*), has a wide range of uses: astringent, homeostatic, antispastic, diuretic, tonic. In cows, decoction obtained from flowers is used in cases of coughing, treating gastrointestinal diseases or as astringent against diarrheal episodes. In calves, decoction from fruits (1:20) has vitaminic, tonic, diaphoretic effect (1-2

spoon/day, given 3-4 days, consecutively), while, decoction obtained from bark (1:10) is used to relax the intestinal muscles 3 times/day (www.sadovod-ogorodnik.ru).

In case of oliguria, farmers can administer to cows, *Cynodon dactylon* (Bermuda grass) in the form of fodder or paste. The paste is made by grinding the plant, mixed with water, which is applied to the pelvic area (Masood *et al.*, 2015). Giving the whole plant of *Cynodon dactylon* (Bermuda grass), acts as anthelmintic or favors treatment against mastitis; rhizomes are used in cases of internal lesions and juice in cases of hematuria (Venkata *et al.*, 2016).

The aerial parts of bermuda grass in amount of 0.3 kg/day are administered as feed for for increasing milk production and milk quality. The leaves are used to treat conjunctivitis by grinding them and using a teaspoon of juice obtained as drops in each eye in the morning for 3 days (Verma, 2014). The whole freshly crushed plant and transformed into a paste is applied externally on wounds for 2-3 days until healing (Nagayya *et al.*, 2017).

Table no. 1 represents the systematic form of the paper.

Plants used in ethnoveterinary medicine with healing effect of injured skin in cows

From plants with antiseptic and anti-inflammatory action used in wound healing and formation of granular tissue, accelerating epithelization of wounds, Davidović *et al.* (2012), remember: yarrow (*Achillea millefolium* L.), or, marigold (*Calendula officinalis*).

From the category of plants with cicatrization effect, Lans *et al.* (2007) remember: *Arnica spp.* (arnica), *Capsella bursa-pastoris* (shepherd's purse), *Lavandula officinalis* (lavender), comfrey (*Symphytum officinale* L.).

Arnica montana (arnica) is the plant used for hundreds of years, due to its therapeutic effects in case of physical trauma at skin level: cuts, scratches, bruises, bites, luxation, sprains, but also use against fever caused by the onset of a cold, heart/circulatory, respiratory tract disorders (Chlodwig, 2015).

Marigold (*Calendula officinalis*) is considered beneficial in many skin disorders, cuts or purulent wounds, but, it has to be used only after the threat of infection has passed. It is not recommended to treat deep wounds because, marigold can seal the

wound too quickly and does not allow drainage (www.sadovod-ogorodnik.ru).

Comfrey (*Symphytum officinale* L.) leaves and stinging nettle (*Urtica dioica* L.), have wound healing action, provided that, their use to be done only after the infecting action has been overcome. The bright skin of the animals is another benefit bring by these plants, which also have an anti-pruritus and disinfecting action (Laudo and Capasso, 2013).

Achillea millefolium (yarrow) leaves mixed with olive oil, beeswax, egg yolk and tallow, are the ingredients used to prepare an ointment at low fire which are apply locally on withers wounds caused by limiters (Uncini Mangenelli *et al.*, 2001).

Excessive consumption of *Symphytum officinale* L. (comfrey) causes serious intoxication manifested by: hepatic toxicity and failure, liver cancer (Tikofsky, 2013). However, it is commonly used as cataplasm in the treatment of abscesses, wounds, acute mastitis, lesions of the udder, edema at the same level or, ketosis treatment (Lans *et al.*, 2007).

The aerial parts of St John's-wort plant (*Hypericum perforatum* L.), boiled in water and administered in drinking water, are used in case of bloating, inflammation and swelling (Jarić *et al.*, 2007).

Externally, chamomile (*Matricaria chamomilla*) tea, has healing effect on ulcers, abscesses, mouth mucosa inflammation or udder inflammation (www.sadovod-ogorodnik.ru).

Castor bean (*Ricinus communis* L.) seeds crushed to extracting the oil, has role in treating wounds by applying a few drops to the wound (Zia-Ud-Din *et al.*, 2010). Powder obtained from castor bean leaves, rubbed on the skin of the animals twice a day also help to wounds healing (Zia-Ud-Din *et al.*, 2010). Powder obtained from castor bean leaves, rubbed on the skin of the animals twice a day also help to wounds healing (Malla and Chhetri, 2012).

By bioactive compounds: ascorbic acid, alkaloids, glucosides, mucilages, essential oils, tannin, which eldeberry leaves contain them are used to treat wounds, infected nails, by applying crushed leaves on affected areas (Bullitta *et al.*, 2007).

Viegi and Ghedira (2014) states that, administration of decoction obtained from aerial parts of black eldeberry it is used in udder inflammation after calving, and dried eldeberry

flowers heated in olive oil are used to treat wounds and inflammation. By applying the bark as ointment, the effect is that of healing. As ointment, elderberry leaves mixed with Scotch broom (*Cytisus scoparius*) and Blue Hound's-tongue (*Cynoglossum creticum*) in addition with olive oil and beeswax, is applied locally, to cure withers inflammation (Uncini Mangenelli *et al.*, 2001).

Chenopodium album (lamb's quarters), considered weed frequently, helps to wound healing in cows, the whole plant being transformed into a paste which is given on the skin only for one day (Akash *et al.*, 2014).

As external use, *Chelidonium majus* (greater celandine) treat various skin problems or lesions at this level. The same use is attributed to *Conium maculatum* (hemlock), for treating various skin problems; wounds, abscesses (Viegi *et al.*, 2003).

A more tenacious plant, more resistant to drought and heat, such as tansy (*Tanacetum vulgare*), is hard to find (www.romedic.ro/), but it also finds use in treating wounds, ulcers (Waller *et al.*, 2001).

Tea root of gentian willow (*Gentiana asclepiadea* L.), is used to treat inflammation and pain relieve. Farmers from Covasna (Transylvania) use the plant to treat digestive disorders in cows mixed with milk and, in mixture with clay or salt and water, is used externally in treatment of mastitis (Bartha *et al.*, 2015). Roots of marsh mallow (*Althaea officinalis*) under decoction form, applied like compresses on swollen withers have anti-inflammatory effect (Uncini Mangenelli *et al.*, 2001).

Juice obtained from squeezing of black mulberry fruits (*Morus Nigra* L.) administered in water *per os* has curative effect on infected skin (Akash *et al.*, 2016). Also, the juice results by grinding peach tree (*Prunus persica*) leaves is applied on wounds or in case of eye problems, under drop form (Luseba and Tshisikhawe, 2013).

Under paste form, in India, the leaves of ivy (*Hedera helix*) are applied in area bitten by snake. In Lucania (Italy), *Senecio vulgaris* (ragwort) has the same use, namely: wound care caused by the snake bite (Viegi and Ghedira, 2014). Crushing the leaves of tobacco, soaking overnight, and oral administration is practiced in case of snake bite or fattening of cows (Yared *et al.*, 2014).

To prevent wound infection caused by wolf bite, in cows, the rhizome of *Veratrum album*

L (white hellebore) in form of compresses is applied to the bite area. Juice obtained by crushing *Sambucus ebulus* (dwarf elder) leaves is applied directly to the place of snake bite or bee sting and, due to its anti-inflammatory action, the root and leaves of this tree are used to treat burned areas, inflammations, edema, eczema and urticaria (Davidović *et al.*, 2012).

For eczema treatment, Al Mamun *et al.* (2015), describes the ingredients of the preparation used: approximately 58 g of *Nicotiana tabacum* leaves, will be soaked in 150 ml cold water and stored overnight. The next day, the water is filtered, then boiled to obtain a concentrated solution, and after cooling, is added 30 ml of rapeseed oil (*Brassica napus*). The mixture is applied several times on affected areas until healing.

Plants with anti-parasitic and anthelmintic action in cows

A widespread use in ethno-veterinary treatments is attributed to *Urtica dioica* (stinging nettle) due to the numerous bioactive compounds: formic acid, mucilages, tannins, vitamins (Bullitta *et al.*, 2007). Crushing seeds of *Urtica dioica* can be used to eliminate endoparasites (Laudo and Capasso, 2013).

The properties of *Calendula officinalis* (marigold) claim it as an excellent antiparasitic and repellent (Viegi *et al.*, 2003).

In fight with external parasites, white lupine (*Lupinus albus*), can be applied as such, directly on the skin of animals or with the water resulting from boiling the seeds (Tikofsky, 2013), which due to their high content in alkaloids give a bitter taste to the skin (Bischoff *et al.*, 2016). On crops, the effect is repellent and aficid (Mayer *et al.*, 2014).

Decoction, made from lupine mixed with bean beans (*Phaseolus vulgaris*), stimulates milk secretion in cows, so it also has galactophore action (Di Sanzo *et al.*, 2013).

Leaves of black and white wormwood (*Artemisia vulgaris*), have been used for centuries as anthelmintic in fight against oval and cylindrical worms, such as: *Moniezia spp*, nematodes: *Ascaris spp.*, but also in treatment of animals infected with blood parasites (*Trypanosoma*, *Plasmodium spp.*) (Severino and Ambrosio, 2012).

In some areas of Italy mixture of wormwood, garlic and lard is given at cows, having vermifug action (Uncini Mangenelli *et al.*, 2001). Fresh leaves mixed with lard, applied to the skin of

bovines, has repellent action on flies (Quave *et al.*, 2012).

Nicotiana tabacum L.(tobacco), is the plant used and reported to have anthelmintic activity in many parts of the world (Gakuya *et al.*, 2011), the leaves being administered as such (Suroowan *et al.*, 2017), or, as nicotine sulfate form, extracted from *Nicotiana tabacum*, and used to eliminate gastrointestinal nematodes: *Monezia*, *Ascaridia*, as well as other parasites (Laudo and Capasso, 2013).

Decoction obtained from tobacco leaves is applied directly to the skin of animals (Naik *et al.*, 2017), which has external anti-parasitic role (Bischoff *et al.*, 2016). The juice obtained from grinding of fresh tobacco leaves, applied on the whole animal body twice a day for one week eliminates calves tick infestations (Sharma *et al.*, 2012).

Using 30 grams of *Nicotiana tabacum* leaves under powder form, applied locally on affected area and covered with clay is a remedy described in case of the myiasis (Farrah, 2009).

Tansy (*Tanacetum vulgare*), alongside other plants such as: wormwood (*Artemisia* spp.) or chicory (*Cichorium intybus*), due to their properties, are also used as anthelmintics (Waller *et al.*, 2001). By secondary bioactive compounds, terpenoids and phenolic compounds, chicory (*Cichorium intybus*) can be used as feed for cows in order to eliminate *Ostertargia ostertargia* (Abo-El-Sooud, 2018).

Stem and seeds of *Cuscuta reflexa* (giant dodder) transformed into a paste is applied to the cow's skin and buffalos for ectoparasites removal (Akash *et al.*, 2016)

Dried roots of *Veratrum album* (white hellebore) applied to the skin or cooked in combination with sap extracting from leaves of *Brassica oleracea* (cabbage), are used in fight against lice in large and small ruminants (Gub, 2005). Locally, decoction of white hellebore leaves and roots can be used in the treatment against mites which causes scabies (Di Sanzo *et al.*, 2013).

A plant considered to be toxic, *Chelidonium majus* (greater celandine), is also involved in ethnoveterinary treatments. Applying fresh leaves of greater celandine or in powder form obtained from drying them, are beneficial in combating scabies in animals, or may have anthelmintic action administered as decoction (Blanco *et al.*, 1999).

Queen of poisons (*Aconitum* spp.) have antiparasitic and repellent action, after Viegi *et al.*, (2003).

Leaves of *Datura stramonium* (thorn apple) under decoction form can be applied externally as antiparasitic, repellent treatment (Pragada *et al.*, 2012).

Aerial part of *Juniperus communis* L (juniper) can be applied in the treatment of skin diseases and fight against infestation with ectoparasites, while, the branches, in elimination of endoparasites and liverworms (Lans *et al.*, 2007).

Consumption of *Juglans nigra* (black walnut), is poisoning for animals, which exhibit symptoms like: seizures, respiratory failure and laminitis, but, nutshell, can be used in therapy against intestinal parasites and to combat diarrhea (Tikofsky, 2013).

The infusion of branches, leaves and flowers of Manna Ash, (*Fraxinus ornus*), it is used in Italy to combat ectoparasitic infestation and to counteract diarrhea (Mayer, 2014).

Plants used in ethnoveterinary medicine to treat digestive disorders in cows

Plants containing hebelorin, gentian, bitter substances, are used to stimulate saliva secretion and provide the optimal buffering capacity of ruminal fluid to prevent acidosis (Rikilt *et al.*, 2011).

In treatment of digestive disorders, salicin from *Salix alba* L.; essential oils from flaxseeds (*Linum usitatissimum*) or common mallow (*Malva sylvestris* L.) have curative effects (Viegi *et al.*, 2003). Decoction obtained from fresh leaves of *Salix alba* L. restores the rumination function.

It can be prepared in mixture with water but also with wine by boiling willow branches with addition of caraway flowers (*Carum Carvi* L) for 1 hour and administered as such (Uncini Mangenelli *et al.*, 2001).

The tannin was, is and will be used traditionally against diarrhea episodes, reducing bleeding and congestion (Stevens, 2003).

The water obtained after 12 hours of maceration of the mixture of eldeberry (*Sambucus* spp.) and Manna Ash (*Fraxinus ornus*) bark, is used to treat gastrointestinal inflammation (Uncini Mangenelli *et al.*, 2001). *Sambucus nigra* L. (black elderberry), has a lot of uses, especially the flowers, but neither the other parts are not forgotten by ethnoveterinary medicine. Black elderberry juice obtained from the infructescences, administered

to cows, is a promoter of growth (Matchett, www.sapork.biz), and curative, black elderberry, can be effective in gastrointestinal disorders treatment such as: colic, impaired digestion, tympanism and meteorism. In order to eliminate the meteorism, dried flowers of elderberry are administered directly in feed or, under infusion form (Mayer *et al.*, 2014)

Flowers of black elderberry are used as a diuretic administrated as decoction; flavonoids in flowers are recognized for the effect of improving immune function, especially in combination with vitamin C (González *et al.*, 2011).

The “wild brother”, *Sambucus ebulus* (dwarf elder) is administered to cows as purgative (Di Sanzo *et al.*, 2013). Elderberry root in form of decoction has purgative action, but is used in the same form in treatment of colds in cows (Viegi and Ghedira, 2014).

Marigold (*Calendula officinalis*) flowers, have bactericidal action in fight against staphylococci and streptococci, relax the smooth muscles of gastrointestinal tract, tonify the liver function, stimulate secretory activity, have choleric effect, used as a treatment for gastritis, gastric ulcer and duodenal ulcer, colitis, enterocolitis. As cholagogue, marigold tincture (1:10/70% alcohol) can be administered to calves three times/day, diluted before use: 1 teaspoon per cup of water or milk (www.sadovod-ogorodnik.ru).

Due to the compounds present in the flowers of *Matricaria chamomilla* (chamomile), essential oils and flavonoids, this is the plant used to treat digestive disorders and abdominal pain in decoction or infusion form (Mayer *et al.*, 2014). The dried chamomile flowers induce changes in bacterial morphology on *Bacillus cereus* and *Staphylococcus aureus* (Abo-El-Sooud (2018).

Chamomile, through its disinfecting, choleric, anti-inflammatory and diaphoretic actions, inhibits fermentation processes in the gut (Bartha *et al.*, 2015). In veterinary practice, chamomile tincture (1:10) is used to treat dyspepsia at calves (1 cup infusion 3-4 times a day one hour before consuming colostrum) (www.sadovod-ogorodnik.ru).

Astringent and antimicrobial properties make by *Hypericum perforatum* L. (St. John's wort) a plant feared against stomach, intestinal, bladder inflammation, which, which in the form of infusion or decoction, encourages tissue repair.

Through its properties, it stimulates the secretion of digestive glands by promoting digestion and better absorption of nutrients (www.sadovod-ogorodnik.ru).

Aerial parts of *Hypericum perforatum* L contain substances that can produce photodermatitis called hypericism under direct influence of solar radiation. Therefore, animals receiving homeopathic treatment based on St John's wort will be kept in shade (Bourke and White, 2004).

Common wormwood or green ginger (*Artemisia absinthium* L.) helps in treatment of gastrointestinal disorders such as: colic, digestive disorders, tympanism and meteorism (Mayer, 2014).

It is true that, the ingestion of large quantities of *Artemisia spp* (wormwood) can cause digestive disorders, hallucinations, delirium, paralysis, and even death, or, change the taste of milk, but, aerial parts of plant mixed with feed or as decoction are used to counteract diarrhea or loss of appetite. The plant is used to stimulate diminished secretion of digestive enzymes, disorders of bile secretion, but also for strengthening the organism (Bischoff *et al.*, 2016). The aerial parts of wormwood, without root, administrated as infusion helps the calves to digest milk more easily, and decoction is used in treating diarrhea to this category of age (Davidović *et al.*, 2012).

The treatment of diarrhea episodes in adult ruminants can be countered, administering the decoction obtained from mixture of aerial parts of *Artemia absintum* and evergreen oak (*Quercus ilex*) bark (González *et al.*, 2011).

Flaxseeds (*Linum Usitatissimum* L.), are used to relieve spasmodic manifestations or convulsions by administering 500 ml of flaxseed oil mixed with 28 ml of turpentine and administered orally at the onset of symptoms. To eliminate the symptoms of flatulence, 300 ml oil obtained from flaxseeds is mixed with 400 ml of turpentine oil and given orally 2-3 times at 2 hours (Al Mamun *et al.*, 2015).

The roots of marsh mallow (*Althaea officinalis*), are used in treatment of digestive and urinary disorders, chronic cough. Mallow has often been considered a functional gastrointestinal agent for ruminants (Quave *et al.*, 2012). Leaves and aerial parts administered *per os* are considered useful in treatment of various digestive disorders such as: abdominal colic, tympanism, reactivation of

rumination, diarrhea and constipation (Uncini Mangenelli *et al.*, 2001).

The leaves of *Malva sylvestris* L. (mallow), in admixture with flaxseeds are administered for reactivation of the rumination in Tuscany (Italy); as decoction in meteorism treating, administered *per os* (González *et al.*, 2011).

Tanacetum vulgare (tansy) contains in inflorescences, floral leafy parts and branches, volatile oils: tannacetone or β -thiona, cineol, 1-camphen, borneol, camphor, etc ; bitter substances, enolic ethers, flavonoids derived from luteolin, gumirezine, tanoids, malic acid, tartaric acid, tannacetamic acid, vitamin B1 (www.infuziedesanatate.ro/). The tincture obtained from tansy flower, intensifies intestinal peristalsis, increase the amount of gastric juice. Infusion from flowers, improves the secretory and motor function of gastrointestinal tract. Calves suffering from enterocolitis can be treated with infusion of tansy flowers: 6 grams/200 ml of water, divided into 3 administrations in warm form (www.sadovod-ogorodnik.ru).

Leaves grinded by *Thymus vulgaris* (thyme) and given in amount of 20 grams 2-3 times/day combats episodes of diarrhea, while stomach pain is treated with 50 grams of whole plant offered to animals once a day (Masood *et al.*, 2015).

Caperspurge (*Euphorbia lathyris*) participate in amelioration of gastrointestinal disorders, being at the same time a repellent for mice (Viegi *et al.*, 2003). Fruits have purgative effect and also it is used to suppress intestinal blockage. The fruits may be administered as decoct, or after cooking them in olive oil, and the oil obtained will be given *per os*. In calves, the ingestion of this plant can cause dysentery (Uncini Mangenelli *et al.*, 2001).

The aerial parts of *Chelidonium majus* (greater celandine) mixed with feed are used to treat intestinal infections in cows, the leaves fight against bloating. Also, leaves of greater celandine, crushed and macerated have antidiarrheal effect (Vlková *et al.*, 2015).

Mercurialis annua (annual mercury), can be used as purgative, although, plant use is not encouraged because of the toxic nature (Viegi *et al.*, 2003). Uncini Mangenelli *et al.* (2001), received positive responses among farmers regarding the use of the whole plant as decoction, the water obtained being given to cows post partum

to eliminate placenta, having at the same time laxative effect (Pieroni *et al.*, 2004).

Another plant with potentially toxic character *Melilotus albus* (white melilot) due to the coumarin content with anticoagulant effect which acts as antivitamin K (Stegelmeier, 2018), is used as a remedy in treating stomach and indigestion problems, one palmul from whole plant being given by 3 time/1 day, maintains vigor (Kumari *et al.*, 2009).

The tympanism, can be remedied administering to ruminants *Colchicum autumnale* (Autumn crocus) (Macleod, 1981), and as external use, fight against ectoparasites (Viegi *et al.*, 2003).

The leaves of black nightshade (*Solanum nigrum*) administered orally reduces manifestations of gastrointestinal disorders in cows (Suroowan *et al.*, 2017). And for the same purpose, decoction of leaves (100 ml) is given once a day for 10 days (Pragada *et al.*, 2012).

For gastritis treatment, the leaves, plays the role of „magician” (Venkata *et al.*, 2016). Decoction obtained from fruits has purgative effect (Gwalwanshi and Bishwas, 2017), and decoction of fruit and leaves of *Solanum nigrum* administered orally is cure used in fever treating. The flatulence in cows can be treated with whole plant transformed into a paste and mixed with 500 ml goat milk. From this extract, 50 ml *per os* is administered, three times a day for 5-6 days (Taranisen and Nirlipta, 2016).

Administration of *Aconitum* (queen of poisons) can eliminate nervous signs and calm animals in cases of ketosis, when it is given in early stage (Macleod, 1981).

Within 6 weeks - 2 months after calving, in cows, may occur (ketosis). *Datura stramonium* (thornapple, jimsonweed) is administered to control seizures (Macleod, 1981).

Other uses of juice obtained from thornapple fresh fruit, although they are toxic, small amounts are administered to cows for cures cough, cold and pneumonia. Dried fruits can also be used for these diseases (Dilpreet *et al.*, 2015).

Roots of *Veratrum album* L., are used as tea in treatment of diarrhea in calves (Bartha *et al.*, 2015).

Rumex acetosella L (sheep sorrel) is used to reduce symptoms caused by gastrointestinal disorders (Viegi *et al.*, 2003). Fruits of *Rumex acetosella* L. as well as those of *Rumex obtusifolius*

L (bitter dock) are administered in case of diarrhea (Bartha *et al.*, 2015).

Decoction of *Rumex crispus* (curly dock) leaves, given *per os*, has also antidiarrheal action (Uncini Mangenelli *et al.*, 2001).

Other plants with anti-diarrhea effect: *Plantago major*, *Calendula officinalis*, *Urtica dioica*, *Althaea officinalis*, *Anethum graveolens*, *Salix alba* L. and *Ulmus fulva* (Lans *et al.*, 2007).

Due to the tannin content, decoction made from evergreen oak (*Quercus ilex*), and sessile oak (*Quercus petraea* Matt) bark, administered orally is used against diarrheal episodes (Mayer, 2014, González *et al.*, 2011, Bartha *et al.*, 2015).

Decoction obtained from *Fraxinus ornus* (Manna Ash) bark and sometimes mixed with elderberry bark, left to soak whole night and then given to cows, can be helpful in the fight against gastrointestinal disorders and diarrhea. Fresh leaves are given to reactivate rumination, have antibacterial action and fight against colds (Uncini Mangenelli *et al.*, 2001).

Fresh *Amaranthus viridis* (Green Amaranth), it is used as purgative in case of constipation in ethnoveterinary medicine (Shah *et al.*, 2012).

Constipation can be counteracted by crushing the entire plant of *Convolvulus arvensis* (European bindweed) which, mixed with sugar, is administered *per os* for 4 days in cows (Akash *et al.*, 2014).

The laxative effect of castor bean (*Ricinus communis* L) is due to ricinoleic acid released into the gut, by hydrolyzing castor oil. Stimulates intestinal secretion, promotes motility and decreases glucose uptake (van der Merwe *et al.*, 2010).

Administration of 20 ml of castor oil obtained from seeds, once a day for 5 days (Pragada *et al.* 2012, Suroowan *et al.*, 2017) has the effect of counteracting constipation, and 50 grams of seeds administered as such for 7 days, has purgative effect (Verma, 2014).

Leaves and seeds of *Silybum eburneum* (milk thistle), are used to prevent ketosis, liver disease, giardia, and have a positive effect on critical growth phases. The plant given to the cows positively influences, the vitality, the productive performances, it has vitaminizing action and maintains the balance of the intestinal flora (www.bionaturesanteanimale.fr).

Fagopyrum esculentum (buckwheat) administered orally, has antimicrobial, bactericidal and diuretic action (Suroowan *et al.*, 2017). It is the plant used as a cure for anemia in cows, administering an amount of about 250 grams of buckwheat leaves, twice a day for 5-7 days (Akash *et al.*, 2014). It can be used even in treating liver problems in cows giving them the same amount of buckwheat leaves administered as feed 2 times a day for 3 consecutive days (Masood *et al.*, 2015).

Urtica dioica, is used as galactogen stimulant (entire plant), the leaves of the plant as functional food (Di Sanzo *et al.*, 2013). Consumption of the aerial parts, combats zinc deficiency or diarrhea (Lans *et al.*, 2007), positively influences appetite, the growth, and, reduces stress (www.bionaturesanteanimale.fr); has antioxidant and antiviral activity (Celik and Tuluze, 2007). Leaves of *Urtica dioica* are recognized for their effect, anti- asthenic (Masood *et al.*, 2015).

Natural calcium intake during calving can be obtained by administering this plant whose role is much more extended by maintaining the mineral balance of cows during the period of calving and lactation (www.bionaturesanteanimale.fr). It is used as a diuretic and antianemic, the plant being rich in iron (McGaw and Jacobus, 2010).

Plants with therapeutic effect in treatment of leg and foot-and-mouth disease in cows

Hyoscyamus niger (stinking nightshade), although, toxic plant, may have healing potential, applied externally in cases of lameness (Viegi *et al.*, 2003), or, pain relief, given *per os* (Suroowan *et al.*, 2017).

The magical effect of *Plantago major* (Broad leaf Plantain), are also found in ethnoveterinary medicine, the crushed vegetal material being applied at level of affected hooves until recovery but it is also used to treat oral cavity problems (Shah *et al.*, 2012). The paste obtained from the leaves and mixed with water is used in toothache and injury. The decoction obtained from 2 bunch of leaves added in one liter of water eliminates the fever, giving 1/6 parts of the decoction 3 times a day (Kumari *et al.*, 2009).

Paste obtained from *Cuscuta reflexa* (giant dodder) applied externally twice daily is used in foot-and-mouth disease treatment (Malla and Chhetri, 2012).

Nicotiana tabacum L.(tobacco) is used in foot-and-mouth disease treatment by leaves crushing and turning them into a paste mixed with sawdust and applied to the affected hooves (Lakshmi and Narasimharao, 2015, Venkata *et al.*, 2016) or, leaves applied directly on hooves without any addition or, administered as feed (Akash *et al.*, 2016).

The paste obtained from buckwheat seeds is applied externally in treatment of foot-and-mouth disease (Sharma *et al.*, 2012).

Plants used for treatment of respiratory diseases and not only in cow

Although, a very poisonous plant, present in Romania, and other countries such as: Italy, Turkey, Serbia, *Helleborus spp.* (hellebore), has curative effect in treating respiratory conditions in cattle, by transcutaneous implantation procedure of a small part of root or branches (Maior, *et al.*, 2013). In cows, raw root of *Helleborus purpurascens* is inserted into the ear to treat inflammation (Vlková *et al.*, 2015); the petiole of *Helleborus bocconeii* inserted into the ear or neck helps in treatment of bronchitis, and leaves of *Helleborus foetidus* are implanted in the ear for treatment of bronchitis and pneumonia (Bartha *et al.*, 2015).

The rhizome implanted transcutaneously into the skin of salbe, has protective effect on animals in acute stages of some chronic diseases. Extract from rhizome or root of hellebore, may have immunostimulatory or immunodepression effect (Davidović *et al.*, 2012).

Incision made in cows tail and insertion of small portion of root from *Helleborus spp.*, plays antipyretic and antibacterial role in cases of pneumonia. Decoction obtained from leaves is given in case of cold and coughing in cows (Uncini Mangenelli *et al.*, 2001). Hellerore, fight against bloating, tympanism and in combating warts (Davidović *et al.*, 2012); but also against various external parasites: lice, fleas, by preparing and applying the powder obtained from rhizomes or root from white hellebore, and in form of tincture, hellebore struggles against *Hypoderma bovis* (www.sadovod-ogorodnik.ru/).

Fresh and crushed leaves of green hellebore or *Helleborus odoratus*, are applied locally to treat purulent abscesses in withers area. It is recommended that, before the treatment to pierce the skin in order to eliminate the pus (Uncini Mangenelli *et al.*, 2001).

Due to the bitter substances present in plant, *Helleborus*, stimulates production of saliva, ensures optimal buffering of ruminal fluid, which has like purpose preventing acidosis (Groot *et al.*, 2001).

With all the benefits, due to its toxicity, the plant will be harvested by a true connoisseur and administered after obtaining the necessary information on the dangerous substances in the plant.

Juniperus communis L. (juniper), in admixture with urine and turpentine is used in Transylvania for treatment of respiratory diseases (Bartha *et al.*, 2015).

Castor bean (*Ricinus communis* L) fight against hyperthermia in cows (Farrah, 2009). The castor bean leaves and strain administered in powder form, orally, for 3 consecutive days, have application in treatment of colds in cows (Akash *et al.*, 2014).

Plants used to treat cardiovascular and nervous disorders in cows

Even if, *Digitalis lanata* (woolly foxglove) is considered to be a toxic plant due to its content in glycosides, saponins, diglanides A, B and C (El Mahdy *et.al.*, 2017), leaves, root or seed used in extremely small amounts is helpful in heart disease. In addition, the leaves of *Digitalis purpurea* (common foxglove) are used in treatment of burned areas (Tikofsky, 2013).

For the same purpose, one palmful leaves of common foxglove fried in oil, can be used as an ointment (Kumari *et al.*, 2009).

The beneficial action given by the convallotoxin content which may be toxic but also therapeutic from *Convallaria majalis* (lily of the valley) is used as alternative to *Digitalis* in cardiac failure treatments due to cardiogenic action (Laudo and Capasso, 2013), and as diuretic stimulant by using dry rhizome, known as the root of *Convallaria*, (<http://poisonousplants.ansci.cornell.edu/>, 2015).

Although extremely toxic plant, rich in high alkaloid content (Gaillard and Gilbert, 2001, Chaney, 2015), Gilotta and Brvar, 2010, Wink, 2009), *Veratrum album* (hellebore) has been used since the Middle Ages in Europe by cow farmers as emetic (Lans *et al.*, 2007). In ethnoveterinary medicine *Veratrum album* L is used to counteract states of nervousness as well as cardiac tonic due

to its content in alkaloids with antihypertensive action (Schmid *et al.*, 2012).

Artemisia vulgaris is used in treatment of nervous disorders (McGaw and Jacobus 2010) or reproductive disorders (Viegi *et al.*, 2003).

Giving it as decoction, 20 ml once a day for 10 days, *Papaver somniferum* (opium poppy) are used to treat nervous system disorders (Pragada *et al.*, 2012).

Plants used in ethnoveterinary medicine to solve reproductive problems, urinary tract disorders in cows

Symphytum officinale L., *Hedera helix* (common ivy) and *Alchemilla vulgaris* are administered in mixture with feed in cases of placental retention (Lans *et al.*, 2007).

Alchemilla vulgaris is also used in promotion of oestrus in animals (Viegi. *et al.*, 2003). A similar effect has *Senecio vulgaris* (ragwort), which, although a toxic plant by its content in senecionine, senecine, senocifidine (El Mahdy *et al.*, 2017), promotes secretion of estrogens and inhibits the secretion of progesterone, prevents and has therapeutic effect in therapy of false gestations (pseudo-gestation) (Laudo and Capasso, 2013).

Malva neglecta (dwarf mallow) similar to *Pteridium aquilinum* (brackenfern) are plants used for treatment of reproductive disorders (Viegi *et al.*, 2003). *Malva sylvestris* L. (mallow) has effect on placental elimination and post partum purgative (Pieroni *et al.*, 2004).

Urtica dioica, has utility in treating various reproductive disorders in cows where, 24 hours after calving, decoction obtained from the mixture of one part of nettle peaks, two parts of mallow (*Malva sylvestris* L.) in addition with bran, has nourishing, astringent and slightly laxative effect (Guarrera, 1987).

The strain and leaves of *Urtica dioica* are known for their anti-inflammatory effect, used to combat rheumatic pain and inflammation of the urinary tract. Also, can be used like treatment in urinary retention. Roots have diuretic action and decrease the amount of urine in bladder. Grinding 200 grams of roots administered once a day for 3 consecutive days is a treatment used in cases of hematuria (Masood *et al.*, 2015).

Juniperus Sabina (juniper) can be used for curative purposes in treatment of reproductive disorders. Few plants have the property of promote oestrus, and juniper is part of them, but

let's not forget about corn (*Zea mays*), whole plant and grain (Viegi *et al.*, 2003). *Juniperus sabina* can cause uterine contractions and placenta elimination (Bartha *et al.*, 2015).

Also, decoction of *Chelidonium majus* can be administered to cows for removal of the placenta (Vlková *et al.*, 2015).

Hedera helix, (ivy) by its content in saponins, chlorogenic and caffeic acid, hederacoside, flavonoids, glycosides, is administered in some parts of Italy to cows after suffering postpartum disorders in form of infusion of leaves, and in other areas, are administered in feed to facilitate the calving (Bullita *et al.*, 2007; Viegi *et al.*, 2003).

Mentha pulegium (mint) has tonic effect on uterus. Both plants, ivy and mint are also beneficial in eliminating problems caused by placental retention (Laudo and Capasso, 2013).

Aerial parts of *Capsella bursa-pastoris* (shepherd's purse) by numerous active compounds: tannin, tyramine, alkaloids, saponins (Viegi *et al.*, 2003), administered as decoction is indicated in pregnant cows against hemorrhages, but also in treating other reproductive disorders (Laudo and Capasso, 2013).

The whole plant, milled or consumed as such, maintains the health of the udder during the calves suckling period (Martínez and Luján 2011).

To prevent abortion in cows, the leaves of *Fragaria L.* (strawberry) can be used as tea (Laudo and Capasso, 2013).

Leaves or leaf-bearing stems of *Ipomea aquatica* (water spinach) given once daily for 15 days, combat the symptoms of hematuria (Satapathy, 2010, Taranisen and Nirlipta, 2016).

Plants used for treatment of mastitis

Mastitis can be treated with plants: *Achillea millefolium* L (yarrow), *Salix alba* L. (white willow), *Taraxacum officinale* (dandelion), *Zea mays* (corn), *Symphytum officinale* L (comfrey), are plants used to treat edema at udder level (Blanco *et al.*, 1999).

Decoction obtained from leaves of *Malva sylvestris* L. (mallow), is applied in form of compresses in treatment of mastitis (Uncini Mangenelli *et al.*, 2001).

Atropa Belladonna although it contains toxic alkaloids such as: atropine, scopolamine, hyosciamine, beladonine and nicotine (El Mahdy *et al.*, 2017), it is used to treat systemic symptoms, localized fever of a reddened and painful tissue, of

Table.1 Species of plants and their healing action

Plants <i>Latin name</i>	Plants English name	Used for:	Autors
<i>Achillea millefolium</i>	yarrow	Wounds healing, antiseptic, anti-inflammatory action; mastitis	Uncini Mangenelli <i>et al.</i> , 2001; Davidović <i>et al.</i> , 2012; Blanco <i>et al.</i> , 1999
<i>Aconitum napellus</i> L.	queen of poisons	transport fever, acute changes, stress; antiparasitic and repellent; eliminate nervous signs in ketosis	McCrory, 2012; Viegi <i>et al.</i> , 2003 Macleod, 1981
<i>Althaea officinalis</i>	marsh mallow	digestive disorder: colic, tympanism, reactivation of rumination, diarrhea and constipation; urinary disorders, chronic cough; anti-inflammatory effect	Uncini Mangenelli <i>et al.</i> , 2001, Quave <i>et al.</i> , 2012
<i>Amaranthus viridis</i>	green amaranth	constipation	Shah <i>et al.</i> , 2012
<i>Arnica montana</i>	<i>arnica</i>	physical trauma at skin level; fever, heart/circulatory, respiratory tract disorders	Chlodwig, 2015
<i>Artemisia vulgaris</i>	wormwood	Anthelmintic, repellent action on flies; gastrointestinal disorders; combat diarrhea; stimulates the secretion of digestive enzymes, disorders of bile secretion; nervous disorders; reproductive disorders	Severino and Ambrosio, 2012; Waller <i>et al.</i> , 2001; Mayer, 2014; Quave <i>et al.</i> , 2012; Bischoff <i>et al.</i> , 2016; McGaw and Jacobus 2010; Viegi <i>et al.</i> , 2003
<i>Atropa Belladonna</i>		Mastitis; pains	McCrory, 2012; Kumari <i>et al.</i> , 2009
<i>Calendula officinalis</i>	marigold	skin disorders; antiparasitic and repellent; bactericidal action; gastritis, gastric ulcer and duodenal ulcer, colitis, enterocolitis	www.sadovod-ogorodnik.ru ; Viegi <i>et al.</i> , 2003;
<i>Capsella bursa-pastoris</i>	shepherd's purse	reproductive disorders, hemorrhages, cicatrization, maintain healthy udder	Laudo and Capasso, 2013; Lans <i>et al.</i> , 2007; Martínez and Luján 2011
<i>Chelidonium majus</i>	greater celandine	Skin lesion, combating scabies, anthelmintic; removal of the placenta, bloating, antidiarrheal	Viegi <i>et al.</i> , 2003; Vlková <i>et al.</i> , 2015; Blanco <i>et al.</i> , 1999
<i>Chenopodium album</i>	lamb's quarters	wound healing	Akash <i>et al.</i> , 2014
<i>Cichorium intybus</i>	chicory	anthelmintics	Abo-EL-Sooud, 2018
<i>Colchicum autumnale</i>	Autumn crocus	tympanism; external antiparasitic	Macleod, 1981; Viegi <i>et al.</i> , 2003
<i>Conium maculatum</i>	hemlock	Wounds healing, abscesses	Viegi <i>et al.</i> , 2003
<i>Convallaria majalis</i>	lily of the valley	cardiac failure; diuretic	Laudo and Capasso, 2013; (http://poisonousplants.ansci.cornell.edu/ , 2015
<i>Convolvulus arvensis</i>	European bindweed	Constipation	Akash <i>et al.</i> , 2014
<i>Cuscuta reflexa</i>	giant dodder	ectoparasites removal, foot-and-mouth disease treatment	Akash <i>et al.</i> , 2016; Malla and Chhetri, 2012
<i>Cynodon dactylon</i>	bermuda grass	Oliguria; internal lesions; hematuria; anthelmintic; mastitis; increasing milk production and milk quality; conjunctivitis; wounds healing	Masood <i>et al.</i> , 2015; Venkata <i>et al.</i> , 2016; Verma, 2014; Nagayya <i>et al.</i> , 2017
<i>Datura stramonium</i>	thorn apple	antiparasitic, repellent; control seizures in ketosis; pain relieve	Pragada <i>et al.</i> , 2012; Macleod, 1981; Kumari <i>et al.</i> , 2009
<i>Digitalis lanata</i>	woolly foxglove	heart disease	Tikofsky, 2013
<i>Digitalis purpurea</i>	common foxglove	burns	Tikofsky, 2013, Kumari <i>et al.</i> 2012
<i>Equisetum arvense</i>	horsetail	maintain the mineral balance immunostimulatory action; gastrointestinal disorders; urinary problems	www.bionaturesanteanimale.fr ; Davidović <i>et al.</i> , 2012; Viegi <i>et al.</i> , 2003;
<i>Eryngium planum</i> L.	sea holly	mastitis	Bartha <i>et al.</i> , 2015
<i>Euphorbia lathyris</i>	caperspurge	gastrointestinal disorders, purgative; repellent for mice,	Viegi <i>et al.</i> , 2003; Uncini Mangenelli <i>et al.</i> , 2001

<i>Fagopyrum esculentum</i>	buckwheat	diuretic; anemia; liver disorder; foot-and-mouth disease	Suroowan <i>et al.</i> , 2017; Akash <i>et al.</i> , 2014; Masood <i>et al.</i> , 2015; Sharma <i>et al.</i> , 2012
<i>Fragaria L.</i>	strawberry	prevent abortion	Laudo and Capasso, 2013
	Manna Ash	Diarrhea, ectoparasites	Mayer, 2014
<i>Fraxinus ornus</i>	Manna Ash +eldeberry	gastrointestinal inflammation	Uncini Mangenelli <i>et al.</i> , 2001
<i>Gentiana asclepiadea L.</i>	gentian willow	Inflammation, pain relieve, digestive disorders, mastitis	Bartha <i>et al.</i> , 2015; Uncini Mangenelli <i>et al.</i> , 2001
<i>Hedera helix</i>	ivy	snake bites; placental retention; postpartum disorders; facilitating calving	Viegi and Ghedira, 2014; Lans <i>et al.</i> , 2007, Bullita <i>et al.</i> , 2007; Viegi <i>et al.</i> , 2003
<i>Helleborus purpurascens, H. bocconeii, H. foetidus</i>	hellebore	respiratory conditions, inflammation; bronchitis ;pneumonia; cold and coughing; immunostimulatory effect, bloating, tympanism; external antiparasitic; treatment of purulent abscesses; prevent acidosis	Maier, <i>et al.</i> , 2013; Vlková <i>et al.</i> , 2015; Bartha <i>et al.</i> , 2015; Uncini Mangenelli <i>et al.</i> , 2001; Davidović <i>et al.</i> , 2012; www.sadovod-ogorodnik.ru/ ; Uncini Mangenelli <i>et al.</i> , 2001; Groot <i>et al.</i> , 2001
<i>Hyoscyamus niger</i>	stinking nightshade	lameness, pain relief	Viegi <i>et al.</i> , 2003; Suroowan <i>et al.</i> , 2017
<i>Hypericum perforatum L.</i>	St John's-wort	stomach, intestinal, bladder inflammation and swelling, treatment against painful joints	www.sadovod-ogorodnik.ru ; Jarić <i>et al.</i> , 2007; Uncini Mangenelli <i>et al.</i> , 2001
<i>Ipomea aquatica</i>	water spinach	hematuria	Satapathy, 2010; Taranisen and Nirlipta, 2016
<i>Juglans nigra</i>	black walnut	intestinal parasite removal, diarrhea	Tikofsky, 2013
<i>Juniperus communis</i>	juniper juniper+wine juniper +urine+ turpentine	infestation with ecto- endoparasites, liverworms; strengthening the joints respiratory diseases	Lans <i>et al.</i> , 2007; Viegi <i>et al.</i> , 2003; Uncini Mangenelli <i>et al.</i> , 2001; Bartha <i>et al.</i> , 2015
<i>Juniperus sabina</i>	juniper	reproductive disorders; placenta elimination	Bartha <i>et al.</i> , 2015;
<i>Linum Usitatissimum L.</i>	flaxseeds flaxseeds + mallow	digestive disorders ; relieves spasmodic manifestations or convulsions; flatulence reactivation of the rumination	Viegi <i>et al.</i> , 2003; Al Mamun <i>et al.</i> , 2015; González <i>et al.</i> , 2011
<i>Lupinus albus</i>	white lupine white lupine+ bean beans	ectoparasites , galactophore action	Tikofsky, 2013; Bischoff <i>et al.</i> , 2016; Di Sanzo <i>et al.</i> , 2013
<i>Malva sylvestris L.</i>	mallow	reactivation of rumination, meteorism; placental elimination and post partum purgative; mastitis,	González <i>et al.</i> , 2011; Pieroni <i>et al.</i> , 2004 Uncini Mangenelli <i>et al.</i> , 2001
<i>Matricaria chamomilla L.</i>	chamomile	digestive disorders, abdominal pain; induce changes in bacterial morphology on <i>Bacillus cereus</i> and <i>Staphylococcus aureus</i> , healing effect, udder inflammation, , inhibits fermentation processes in the gut; dyspepsia	Mayer <i>et al.</i> , 2014; Abo-El-Sooud, 2018; www.sadovod-ogorodnik.ru ; Bartha <i>et al.</i> , 2015
<i>Melilotus albus</i>	white melilot	indigestion problems	Kumari <i>et al.</i> , 2009
<i>Mentha pulegium</i>	mint	placental retention	Laudo and Capasso, 2013
<i>Mercurialis annua</i>	annual mercury	Purgative, placenta removal	Viegi <i>et al.</i> , 2003; Pieroni <i>et al.</i> , 2004; Uncini Mangenelli <i>et al.</i> , 2001
<i>Morus Nigra L.</i>	black mulberry	infected skin	Akash <i>et al.</i> , 2016
<i>Nicotiana tabacum L.</i>	tobacco	snake bites , fattening; anthelmintic; tick infestations; myiasis; foot-and-mouth disease, eczema	Yared <i>et al.</i> , 2014; Gakuya <i>et al.</i> , 2011; Sharma <i>et al.</i> , 2012; Suroowan <i>et al.</i> , 2017; Farrah, 2009); Bischoff <i>et al.</i> , 2016; Lakshmi and Narasimharao, 2015; Venkata <i>et al.</i> , 2016; Akash <i>et al.</i> , 2016; Al Mamun <i>et al.</i> , 2015;
<i>Papaver somniferum</i>	opium poppy	nervous system disorders; mastitis and inflammation of udder	Pragada <i>et al.</i> , 2012; Bartha <i>et al.</i> , 2015

<i>Plantago lanceolata</i>	ribwort <i>plantain</i>	Inflammation, pain relieve	Bartha <i>et al.</i> , 2015
<i>Plantago major</i>	Broad leaf <i>Plantain</i>	Hooves and oral cavity treatment; toothache, fever	Shah <i>et al.</i> , 2012; Kumari <i>et al.</i> , 2012
<i>Prunus persica</i>	peach tree	wounds healing, eye problems	Luseba and Tshisikhawe, 2013
<i>Quercus ilex</i>	evergreen oak		
<i>Quercus petraea</i> Matt	<i>sessile oak</i>	diarrhea	Mayer, 2014, González <i>et al.</i> , 2011, Bartha <i>et al.</i> , 2015 Bartha <i>et al.</i> , 2015
<i>Ricinus communis</i> L	castor bean	constipation; laxative effect, stimulates intestinal secretion, dermatophilia, placental retention; wound healing; hyperthermia	Fitsum and Mekonnen, 2017; van der Merwe <i>et al.</i> , 2010; Zia-Ud-Din <i>et al.</i> , 2010; Malla and Chhetri, 2012; Akash <i>et al.</i> , 2014
<i>Rumex acetosella</i> L	<i>sheep sorrel</i>	gastrointestinal disorders, diarrhea	Viegi <i>et al.</i> , 2003; Bartha <i>et al.</i> , 2015
<i>Rumex crispus</i>	curly dock		
<i>Rumex obtusifolius</i> L	bitter dock	diarrhea	Uncini Mangenelli <i>et al.</i> , 2001; Bartha <i>et al.</i> , 2015
<i>Sambucus ebulus</i>	dwarf elder	Purgative, snake bite, treat burned areas, inflammations, edema, eczema, urticaria	Di Sanzo <i>et al.</i> , 2013; Davidović <i>et al.</i> , 2012
<i>Sambucus nigra</i>	black eldeberry	Wounds healing, infected nails; udder inflammation; promoter of growth; gastrointestinal disorders, laxative and purgative	Bullitta <i>et al.</i> , 2007; Viegi and Ghedira, 2014; Matchett, www.sapork.biz ; Mayer <i>et al.</i> , 2014
<i>Senecio vulgaris</i>	ragwort	snake bites, promotes secretion of estrogens; pseudo-gestation	Viegi and Ghedira, 2014; Laudo and Capasso, 2013
<i>Silybum eburneum</i>	milk thistle	liver disorder, giardia, growth	www.bionaturesanteanimale.fr
<i>Solanum nigrum</i>	black nightshade	gastrointestinal disorders; gastritis; purgative; flatulence; fever	Suroowan <i>et al.</i> , 2017; Pragada <i>et al.</i> , 2012; Venkata <i>et al.</i> , 2016; Gwalwanshi and Bishwas, 2017; Taranisen and Nirlipta, 2016
<i>Symphytum officinale</i> L	Comfrey	wounds healing; anti-pruritus and disinfectant of the skin, acute mastitis, lesions, edema of the udder, ketosis	Laudo and Capasso, 2013; Lans <i>et al.</i> , 2007; Blanco <i>et al.</i> , 1999
<i>Tanacetum vulgare</i>	tansy	wounds treating, ulcers, anthelmintics, intensifies intestinal peristalsis, enterocolitis (calves)	Waller <i>et al.</i> , 2001; www.sadovod-ogorodnik.ru
<i>Thymus vulgaris</i>	thyme	diarrhea, stomach pain	Masood <i>et al.</i> , 2015
<i>Urtica dioica</i>	stinging nettle	anthelmintic, wound healing; galactogen; functional food, natural calcium intake; combats zinc deficiency, diarrhea, anti-asthenic and antianemic effect; reproductive disorders; rheumatic pain inflammation of the urinary tract; diuretic,	Laudo and Capasso, 2013; Lans <i>et al.</i> , 2007; Di Sanzo <i>et al.</i> , 2013; McGaw and Jacobus, 2010; Masood <i>et al.</i> , 2015; Guarrera, 1987
<i>Veratrum album</i> L	white hellebore	wolf bite, lice removal; mites; diarrhea; emetic; counteract states of nervousness, antihypertensive action	Davidović <i>et al.</i> , 2012; Gub, 2005; Lans <i>et al.</i> , 2007; Di Sanzo <i>et al.</i> , 2013; Bartha <i>et al.</i> , 2015; Schmid <i>et al.</i> , 2012
<i>Viburnum spp</i>	viburnum	coughing, treating gastrointestinal disorder, diarrhea; relax intestinal muscles, vitaminizing, tonic, diaphoretic	www.sadovod-ogorodnik.ru

the quarters of udder affected by acute mastitis (McCrory, 2012). Leaves prepared as ointment, relieve “killing pains” in cows (Kumari *et al.*, 2009).

Seeds of *Papaver somniferum* (opium poppy) administered as feed are used in cases of mastitis and inflammation of udder (Bartha *et al.*, 2015).

In Covasna county (Transylvania, Romania), *Eryngium planum* L (sea holly), with its anti-inflammatory properties is used by preparing a

tea with which, is wash the inflamed udder caused by mastitis (Bartha *et al.*, 2015).

Leaves of *Plantago lanceolata* (ribwort plantain), rich in active compounds such as: iridoid, called aucubine, flavonoids, mucilages, volatile oils and antibiotic substances, phytonocides, phytoquinone, carotenoids, minerals (Rotaru, www.csid.ro/) are used to treat inflammation and reduce pain (Bartha *et al.*, 2015).

Plants used in ethnoveterinary medicine for relieving pain in cows

Pain in cow, can be removed by using ointment, which has like ingredient, leaves of thorn apple (*Datura stramonium*) (Kumari *et al.*, 2009).

Leaves, flowers of boneset (*Eupatorium perfoliatum*), diminish bone pain and fever in cows, have immunostimulant effect (Tikofsky, 2013).

Fruits and small branches of *Juniperus communis* L (juniper) in form of decoction prepared with wine, have role of strengthening the joints, applied in form of compression on the tired joints of animals (Uncini Mangenelli *et al.*, 2001).

Hypericum perforatum L. (St John's-wort), has analgesic and healing effect of wounds applied in form of mixture (olive oil and macerated plant) with which the painful joints are massaged or is applied to the lesions. After the same author, *Salix alba* L. (white willow) helps relieve pain, inflammation, and leaf branches and the bark of the tree given in feed, improves the rumination of cows.

Conclusion

The plants existing in spontaneous flora of Romanian pastures can be used by the farmers in large numbers as treatments for healing some disorders at cows. Most of the plants have complex action, but most can be used in treatment of gastrointestinal disorder, mastitis, wound healing, antiparasitic. Some diseases can be treated with the help of plants, which represents almost the only way for farmers registered in the organic farming system to keep their livestock healthy.

References

1. Abo-El-Sooud K (2018). Ethnoveterinary perspectives and promising future, International Journal of Veterinary Science and Medicine, 6:1-7
2. Akash T, Adnan M, Mussarat S (2016). Use of ethnoveterinary medicines by the people living near pak-afghan border region, Slov Vet Res, 53(3), 119-30, UDC 615.89:636.09:616:61:001.5(549.1)
3. Akash T, Mussarat S, Adnan M, AbdElsalam NM, Ullah R, Khan, A.L. (2014). Ethnoveterinary Study of medicinal plants in a tribal society of Sulaiman Range. The Scientific World Journal pg.1-10, <http://dx.doi.org/>
4. Al Mamun A, Tumpa SI, Hossain MdI, IshikaT (2015) Plant resources used for traditional ethnoveterinary phytotherapy in Jessore District, Bangladesh, Journal of Pharmacognosy and Phytochemistry, 3 (6), 260-267
5. Bartha SG, Quave CL, Balogh L, Papp N (2015) Ethnoveterinary practices of Covasna County, Transylvania, Romania. J. of Ethnobiology and Ethnomedicine, vol.11:35, 1-22, DOI 10.1186/s13002-015-0020-8
6. Bischoff T, Vogl CR, Ivemeyer S, Klarer F, Meier B, Hamburger M (2016) Plant and natural product based homemade remedies manufactured and used by farmers of six central Swiss cantons to treat livestock. Livestock science, 189, 110-125
7. Blanco E, Macia MJ, Morales R (1999) Medicinal and veterinary plants of El Caurel (Galicia, northwest Spain), Journal of Ethnopharmacology, 65, 113-124
8. Bourke CA, White JG (2004) Reassessment of the toxicity of *Hypericum perforatum* (St John's wort) for cattle. Aust Vet J., 82 (11), 707-710
9. Bullitta S, Piluzza G, Viegi L (2007) Plant resources used for traditional ethnoveterinary phytotherapy in Sardinia (Italy), Genet Resour Crop Evol, 54, 1447-1464
10. Celik I, Tuluze Y (2007). Elevation protective role of *Camellia sinensis* and *Urtica dioica* infusion against trichloroacetic acid-exposed in rats, Phytotherapy reaserch, 11, 1039-1044
11. Chaney M (2015). Livestock - Toxic Plants <http://www.piercecountycd.org/>
12. Chlodwig F (2015). Herbal medicinal product and feed additives in veterinary medicine and animal nutrition. Le universita clinical features and circumstances of exposure. Clin Toxicol, 49, 671-680.
13. Davidović V, Joksimović TM, Stojanović B, Relić (2012). Plant usage in protecting the farm animal health. Biotechnology in Animal Husbandry, 28 (1), 87-98
14. Di Sanzo P, De Martino L, Mancini E, De Feo V (2013). Medicinal and useful plants in the tradition of Rotonda, Pollino National Park, Southern Italy, Journal of Ethnobiology and Ethnomedicine, 9 (1), 1-9
15. Dilpreet K, Jaiswal K, Mishra S (2015). Ethnoveterinary practices in India: A Review, European journal of pharmaceutical and medical research, 2(7), 139-143
16. El Mahdy C, Popescu S, Borda C (2017). Plants that can be Poisonous for Cows. A Review. Bulletin UASVM Animal Science and Biotechnologies, 74(2), 69-83
17. Farrah D (2009). Documentation of ethno-veterinary practices in urban and peri- urban areas of Faisalabad (Pakistan), PhD tesis, Faculty Of Veterinary Science University Of Agriculture, Faisalabad Pakistan, 1-269
18. Fitsum D, Mekonnen A (2017) Ethnoveterinary Medicine Practices in Ethiopia: Review. Advances in Biological Researchm, 11 (3), 154-160
19. Gaillard Y, Gilbert P (2001). LC-EI-MS determination of veratridine and cevadine in two fatal cases of *Veratrum album* poisoning. J. of Analytical Toxicology, 25, 481- 485
20. Gakuya DW, Mbaria JM, Kiama SG, Gathumbi PK, Mathiu M, Nguta JM (2011) Ethnoveterinary Medicine: The prospects of integrating medicinal plant products in Veterinary Medicine in Kenya. The Kenya Veterinarian. A Journal of the Kenya Veterinary Association, 35 (2), 1-11
21. Gilotta I, Brvar M (2010). Accidental poisoning with *Veratrum album* mistaken for wild garlic

- (*Allium ursinum*). Clin Toxicol (Phila) 48, 949–952. doi:10.3109/15563650.2010.5
22. González JA, García-Barriuso M, Amich F (2011). Ethnoveterinary medicine in the Arribes del Duero, western Spain, Vet Res Commun, 3, 283–310
 23. Groot M, Kleijer-Ligtenberg G, Van Asseldonk T, Hansma H (2011). Koe Natuurlijk *BioKennis*, BAS number BO-04-002-002.029 RIKILT-Wageningen UR
 24. Gub J (2005). Népi növényismeret a Nagy-Homoród mentén. In: Zsigmond G, editor. Növények a folklórban. Bucharest: A Magyar Köztársaság Kulturális Intézete, 148–162
 25. Gwalwanshi DR, Bishwas AJ (2017). Documentation of ethnoveterinary medicinal flora of Balaghat District, Madhya Pradesh, India. Int. J. Res. Ayurveda Pharm., 8 (2), 279–284
 26. Jarić S, Popović Z, Mačukanović-Jocić M, Djurdjević L, Mijatović M, Karadžić B, Mitrović M, Pavlović P (2007). An ethnobotanical study on the usage of wild medicinal herbs from Kopaonik Mountain (Central Serbia). J. of Ethnopharmacology, 111, 160–175.
 27. Kohli RN (2015). Ethno-veterinary Medicine: A Concept for Sustainable Livestock Production), Royal Offset Printers, A-89/1, Naraina Industrial Area, Phase-I, New Delhi-110 028
 28. Krishna L, Swarup D, Patra DRC (2005). An overview of prospects of ethno-veterinary medicine in India. Indian. J. Anim. Sci., 75, 1481–1491.
 29. Kumari P, Singh BK, Joshi GC, Tewari LM (2009). Veterinary Ethnomedicinal Plants in Uttarakhand Himalayan Region, India. Ethnobotanical Leaflets, 13, 1312–27
 30. Lakshmi N, Narasimharao GM (2015). Plants used in ethnoveterinary medicine by tribals of Visakhapatnam and Vizianagaram Districts, Andhra Pradesh, India. Int. International Journal Pure App. Biosci., 3 (2), 432–439
 31. Lans C, Turner N, Khan T, Brauer G, Boepple W (2007). Ethnoveterinary medicines used for ruminants in British Columbia, Canada, J Ethnobiol Ethnomed; 3 (11), 1–22, doi: 10.1186/1746-4269-3-11
 32. Laudo M, Capasso R (2013). Useful plants for animal therapy. A alternative medicine. www.oapublishinglondon.com/article/327
 33. Luseba D and Tshisikhawe MP (2013). Medicinal plants used in the treatment of livestock diseases in Vhembe region, Limpopo province, South Africa. Journal of Medicinal Plants Research Vol. 7(10), 593–601, DOI:10.5897/JMPR012.1213
 34. Macleod G (1981). The Treatment of Cattle by Homoeopathy, www.randomhouse.co.uk
 35. Malla B, Chhetri RB (2012). Ethnoveterinary practices of some plant species by ethnic people of Parbat district, Nepal, Kathmandu University Journal Of Science, Engineering And Technology, 8 (I), 44–50, https://doi.org/10.3126/kuset.v8i1.6042
 36. Martínez GJ, Luján MC (2011). Medicinal plants used for traditional veterinary in the Sierras de Córdoba (Argentina): An ethnobotanical comparison with human medicinal uses. Journal of Ethnobiology and Ethnomedicine, pg 7–25
 37. Masood KA, Shafkat AG, Pranav K, Bhadwal MS, Rizwan JR (2015). Etno-veterinary practices used for the treatment of animal diseases in Doda district, Jammu and Kashmir, Indian Journal of traditional knowledge, 14, 306–312
 38. Matchett JR. A Review of the Use of Plants as Ethno-Veterinary Medical Replacements for Antibiotic Growth Promoters, https://www.sapork.biz/
 39. Mayer M (2014). Complementary and alternative medicine on italian organic farms and ethnoveterinary as a possible strategy for disease treatment, https://mariamayer.it/.../Mayer-PhD-thesis
 40. Mayer M, Vogl CR, Amorena A, Hamburger M, Walkenhorst M (2014). Treatment of organic livestock with medicinal plants: A systematic review of European ethnoveterinary research, Forsch Komplementmed, 21, 375–386
 41. Mayer M, Zbinden M, Vogl CR, Ivemeyer S, Meier B, Amorena M, Maeschli A, Hamburger M, Walkenhorst M (2017). Swiss ethnoveterinary knowledge on medicinal plants – a within-country comparison of Italian speaking regions with north-western German speaking regions, Journal of Ethnobiology and Ethnomedicine, 13:1, DOI 10.1186/s13002-016-0106-y
 42. McCrory L (2012). Homeopathy For Livestock http://www.nofamass.org/
 43. McGaw LJ, Jacobus N, Eloff JN (2010). Chapter 1. Methods for Evaluating Efficacy of Ethnoveterinary Medicinal Plants, in Ethnoveterinary Botanical Medicine Herbal Medicines for Animal Health, CRC Press, https://doi.org/10.1201/EBK1420045604-c1
 44. Mooventhan P, Manimaran A, Kumar KS, Selvan AS, Prakash MA (2016). Indigenous ethnoveterinary medicinal practices for management of mastitis in dairy cattle, Indian J. Anim. Res., 50 (1), 137–139
 45. Moreki JC, Tshireletso K, Okoli IC (2012). Potential use of ethnoveterinary medicine for retained placenta in cattle in Mogono, Botswana J. Anim. Prod. Adv., 2(6), 303–309
 46. Nagayya S, Gotruvalli M, Kumar P (2017). Utilization of ethno-veterinary medicinal plants in Hassan district of Karnataka, India, International Journal of Pharmacy and Pharmaceutical Sciences, 9 (4), 107–112
 47. Pieroni A, Howard P, Volpato G, Santoro RF (2004). Natural remedies and nutraceuticals used in ethnoveterinary practices in inland southern Italy, veterinary research communication, 28, 55–80
 48. Poutaraud A, Michelot-Antalik A, Plantureux S (2017). Grasslands: A Source of Secondary Metabolites for Livestock Health, J. Agric. Food Chem, 65 (31), 6535–6553.
 49. Pragada PM, Geddada M, Narasimha R (2012). Ethnoveterinary medicinal practices in tribal regions of Andhra Pradesh, India, Bangladesh J. Plant Taxon., 19 (1), 7–16
 50. Quave CL, Pardo-de-Santayana M, Pieroni A (2012). Medical ethnobotany in Europe: from field ethnography to a more culturally sensitive evidence-based CAM?, Hindawi Publishing Corporation Evidence-Based Complementary and Alternative Medicine, 2012, Article ID 156846, 1–17

51. Rikilt GM, Kleijer-Ligtenberg G, Tedje van Asseldonk IEZ, KoeNatuurlijk HH (2011). BioKennis.BAS number BO-04-002-002.029.mRIKILT-Wageningen UR
52. Rotaru, P. Pătlăgînă (*Plantago lanceolata*) - Beneficii și proprietăți <http://www.csid.ro/>
53. Satapathy KB (2010). Ethnoveterinary practices in Jajpur district of Orissa, Indian Journal Of Traditional Knowledge, 9 (2), 338-343
54. Schmid K, Ivemeye S, Vogl C, Klarer F, Meier B, Hamburger M, Walkenhorst M (2012). Traditional Use of Herbal Remedies in Livestock by Farmers in 3 Swiss Cantons (Aargau, Zurich, Schaffhausen) Forsch Komplementmed, 19, 125-136.
55. Selvaraju A, Ayyanar M, Rathinakumar SS, Sekar T (2011). Plants used in ethno-veterinary medicine by malayali tribal in Salem district of Tamil Nadu, India. Medicinal Plants, 3(3): pp.1-6
56. Severino L, Ambrosio L (2012). Medicinal Plants: Biodiversity and Drugs: Chapter 12. Herbal Drugs Used for Domestic Animals, pp. 334- 354, CRC Press, Taylor & Francis Group, Boca Raton
57. Shah GM, Ahmad M, Arshad M, Khan MA, Zafar M, Sultana S (2012) Ethno-phyto-veterinary medicines in northern Pakistan, The Journal of Animal & Plant Sciences, 22(3), 791-797
58. Sharma, T.P., Sabita, D., Borthakur, S. K. (2012). Documentation of Ethno-veterinary practices in Sikkim, India, Pleione 6(2), 353 – 358
59. Sri Balaji N, Vikrama Chakravarthi P (2010). Ethnoveterinary practices in India - A Review. Vet. World., 3, 549-551.
60. Stevens M (2003). Plant guide-common elderberry *Sambucus nigra* L. ssp. *canadensis* (L.) R. Bolli <http://plants.usda.gov>
61. Suroowan S, Javeed F, Mushtaq A, Zafar M, Mehwish JN, Sadaf K, Javed A, Mahomoodally MF (2017). Ethnoveterinary health management practices using medicinal plants in South Asia – A review. Vet Res Commun, 41, 147-168
62. Taranisen P, Nirlipta M (2016). Indigenous knowledge on animal health care practices in Kendrapara district of Odisha, India, International Letters of Natural Sciences, 53, 10-27
63. Tikofsky L (2013). Organic Dairy Herd Health: Alternative and Complementary Treatment and Medicines <http://articles.extension.org/>
64. Uncini Mangenelli RE, Camangi F, Tomei PE (2001). Curing animals with plants: traditional usage in Tuscany (Italy), journal of Ethnopharmacology, 78, 171-191
65. Van der Merwe D, Swan GE, Botha C J (2010). Use of ethnoveterinary medicinal plants in cattle by Setswana-speaking people in the Madikwe area of the North West, Province of South Africa, <http://hdl.handle.net/>
66. Venkata K, Rami R, Nagalakshmi Devamma M, Prayaga PM (2016). Ethnoveterinary medicinal practices in Rayala Seema regions of Andhra Pradesh, India, European Journal of Environmental Ecology, 3(1), 7-20.
67. Verma RK (2014). An ethnobotanical study of plants used for the treatment of livestock diseases in Tikamgarh District of Bundelkhand, Central India, Asian Pac J Trop Biomed, 4(Suppl 1), S460-S467
68. Verma S, Singh SP (2008). Current and future status of herbal medicines, Veterinary World, 1(11), 347-350
69. Viegi L, Ghedira K (2014). Preliminary Study of Plants Used in ethnoveterinary medicine in Tunisia and in Italy, Afr J Tradit Complement Altern Med. 11(3), 189-199.
70. Viegi L, Pieroni A, Guarrera PM, Vangelisti R (2003). A review of plants used in folk veterinary medicine in Italy as basis for a databank Journal of Ethnopharmacology 89, 221-244
71. Vlková M, Kubátová E, Šlechta P, Polesný Z (2015). Traditional use of plants by the disappearing Czech diaspora in Romanian Banat, Scientia agriculturae bohemica, 46, (2), 49-56
72. Waller PJ, Bernes G, Thamsborg SM, Sukura A, Richter SH, Ingebrigtsen K, Höglund J (2001). Plants as De-Worming Agents of Livestock in the Nordic Countries: Historical Perspective, Popular Beliefs and Prospects for the Future, Acta vet. Scand, 42, 31-44
73. Wanzala W, Zessin KH, Kyule NM, Baumann MPO, Mathias E, Hassanali A (2005). Ethnoveterinary medicine: a critical review of its evolution, perception, understanding and the way forward, Livestock Research for Rural Development 17 (11), <http://www.lrrd.org/lrrd17/11/wanz17119.htm>
74. Wedson MSS, Barboza RRD, Rocha MSP, Alves RRN, Mourão JS (2012). Animal-based medicines used in ethnoveterinary practices in the semi-arid region of Northeastern Brazil, Anais da Academia Brasileira de Ciências 84 (3), 669-678
75. Wink M (2009). Mode of action and toxicology of plant toxins and poisonous plants, Mitt. Julius Kühn-Inst: 93-112
76. Yared Y, Demissew BH, Wubeante YA (2014). Ethnoveterinary medicines in four districts of Jimma zone, Ethiopia: cross sectional survey for plant species and mode of use. BMC Veterinary Research, 10:76, 1-12
77. Zia-Ud-Din S, Iqbal Z, Khan MN, Jonsson NN, Siddique M (2010). Documentation of ethnoveterinary practices used for treatment of different ailments in a selected hilly area of Pakistan, International Journal Of Agriculture & Biology, 12, 353-358
78. X X X www.bionaturesanteanimale.fr/
79. X X X www.infuziedesanatate.ro/
80. X X X www.sadovod-ogorodnik.ru/
81. X X X www.romedic.ro/
82. <http://poisonousplants.ansci.cornell.edu/>, 2015