REPORT ON THE SITUATION OF EPIDEMIOLOGY IN ALGERIA FROM HYDATIDOSIS (2007-2010)

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Abstract. Objective: This study is evaluated the dynamics of echinococcosis in Algeria during four years of research, thus we have carried out inspections at slaughterhouses wilaya of 19 around the country (North, South, East, West) in the objective of a national survey of hydatid disease. Materials and methods: the means of realizing this work was difficult for distant regions, to properly accomplish our inspection we used the method of communication by the Internet or by administrative requests sent to veterinary inspectors of these regions to have a monthly and annual cases of hydatidosis, whereas for the region closest we conducted ourselves control carcasses and organs in place with the help of several colleagues. after all we recorded post-mortem cases of hydatid cyst in the affected organs, with the total number of animals slaughtered per day, and can lead to monthly and annual number of cases found and finally calculates the prevalence and traced the growth curve or decrease each year. Results: Our results show variations over the growing prevalence, we observed for bovine hydatid cyst in liver and lung average values (95.16% -96.16%) respectively in the Algiers Constantine during the four years. for sheep we mean prevalence for liver and lung (96.14% - 94.84%) respectively in the regions of Ourgla and Ghardaia, whereas the goats we in the same order (90 , 01% - 82.98%) respectively in the regions of Bejaia and Tipaza. Conclusion: The data obtained in this work leading us to conclude that Echinococcosis remains rife in an endemic state in Algeria, and its growth curve does not cease to grow in many parts of the Algerian territory, despite the system established by the state therefore it should be given bottom to achieve the definitive host in a responsible way with technical decisive to achieve beneficial results even with the use of modern diagnostic tools for this disease early and to protect human health .

Keywords: dynamics of echinococcosis, bovine hydatid cyst, regions of Bejaia and Tipaza

INTRODUCTION

The hydatid cyst is an anthropozoonosis, A disease that can affect both animals (dogs, sheep) that man, caused by a Echinococcus granulosus parasite that is transmitted from dogs to humans by the tapeworm eggs that are in the dog it catches the disease after eating meat from infected sheep.

The fight against this zoonosis is one of the priorities of veterinary services account of the serious consequences for animal and public health and even the Algerian economy.

To impede the spread of this disease, a device and companions have been established by the Ministry of Agriculture and Rural Development through all veterinary services along with these companions all services involved in the Algerian territory organize operations point to strengthen the control program in place and awareness. To eliminate clandestine slaughtering and selling black meat unstamped by the state veterinarian especially during religious festivals.

According to statistics from the Ministry of Health, an average of 600-700 case of hydatid cyst is recorded annually, it is true that it is a curable disease, but at the cost of

major surgery and difficult. According to the same services the cyst is responsible for nearly 2000 cases of surgery each year (Journal ELWATAN 2003), to prevent the spread of this parasite is necessary reminded that we should not throw the bodies in nature or suspected landfills because it will be quickly spotted by the dogs that pass eventually to humans. Infested viscera must be downright destroyed or buried deep enough so that it no longer be detected by dogs.

Hydatid disease is a parasitic zoonosis very grave found practically on all the Algerian territory, unfortunately it`s not a notifiable in Algeria since 1979, it is the subject `importance under declaration indeed these clinical manifestations in man are often silent, only complicated forms requiring surgery or those discovered during radiological `routine chest can be the object statement in 1975 during the elaboration of the program country's health hospital data had resulted in the following estimates:

Disease incidence is 06 cases per 100,000 inhabitants and the number of surgeries for hydatid cyst is 600/an and cost of` intervention was 2000 DA / sick.

during the year 1980 for the National uneenquête congrega hydatidosis Algiers allowed to enroll a thousand cases made (970), in the same study the rate of `human hydatidosis was estimated at about 18 cases per 100,000 inhabitants .

The most affected regions are constituted by the wilayas located in the highlands: sidibelabes-saida-tiaret-medea-djelfa-laghouat-m -sila-setif batna-oum el-Bouaghi Constantine.

With these data it should be noted that nearly 70% of the organs of animals seized at slaughterhouses are caused by echinococcosis the losses in animal protein are estimated at 600 tons of meat per year.

The animal can easily infest hydatid disease by dog droppings thrown in the rich nature of Echinococcus eggs can be transmitted by wind at distances otherwise limited by the feet of animals, birds, worms earth.

In addition, very significant progress has been made in the field of immunology, diagnosis and treatment of parasitosis (Moro and Schantz, 2006, Zhang et al., 2003). However, the socio-economic impact of hydatidosis remains important.

To eradicate the disease coordination between the different factors (human health and animal health) is required (Craig and Larrieu, 2006; Togerson and Budke, 2003; Gemmel et al., 2001b; Yameogo and Coulibaly, 2000) and taking into account contributions of international cooperation (Ito et al., 2006; Moro and Schantz, 2006).

Over the last 10 years and according to the bibliographic database Medline (U.S. National Library of Medicine), publications on hydatidosis in North Africa have affected 93% of Tunisia, Morocco and Egypt, other countries (Algeria , Libya, Sudan) was not affected by 7% of publications indexed. In Algeria, the prevalence of hydatidosis and Dar el Alkarmi reported by Dar (1997) is 3.4 to 4.6 cases per 100 000 population, the figures given by Seimenis (2003) is 1.8 to 2, 3 cases per 100,000 inhabitants.

As a study in one service pneumophtisiology CHU Constantine (Haddad et al., Unpublished work), it has identified more than 80 new cases per year result in line with a higher prevalence estimates.

Moreover, hydatidosis is a disease whose impact on health is largely undervalued at the international level and in particular in Algeria (Larbaoui and Alloula, 1979), with up to more than 75% of cases diagnosed in clinics and hospitals are not taken into account in national databases and reports from health authorities (Budke et al., 2006; Togerson et al., 2006).

This work highlights the status of hydatidosis in Algeria bitter ten or fifteen years of the last survey and to show the current status of hydatid cyst tough trying several outreach and awareness .

MATERIAL AND METHOD

This research is a kind of inquiry and investigation, since it began in November 2007 was completed in 2010, the realization of this work was effected by any means of communication, assistance provided by colleagues the field was very important, it is a team effort between organized veterinary colleagues 14 wilayas of Algeria also collaboration with the Ministry of Agriculture and Fisheries, over thirty colleagues participated so far and near has created this situation, the beginning of this study was the preparation of requests faxed to government veterinary inspectors all wilaya South, North, east and West regions are far from the capital Algiers, are mentioned on the map Fig. 1, which aims to have information regarding the slaughter rate for all species (sheep, cattle, goats, camel), with the amounts of seizures for all causes accurately bodies seized due to hydatidosis, and that of all abattoirs and slaughter of these departments Tandisque regions closest control was in place, will have moved instead said to have the information, once permission was accorded to us, we proceeded to the operation of any balance sheets slaughter and seized.

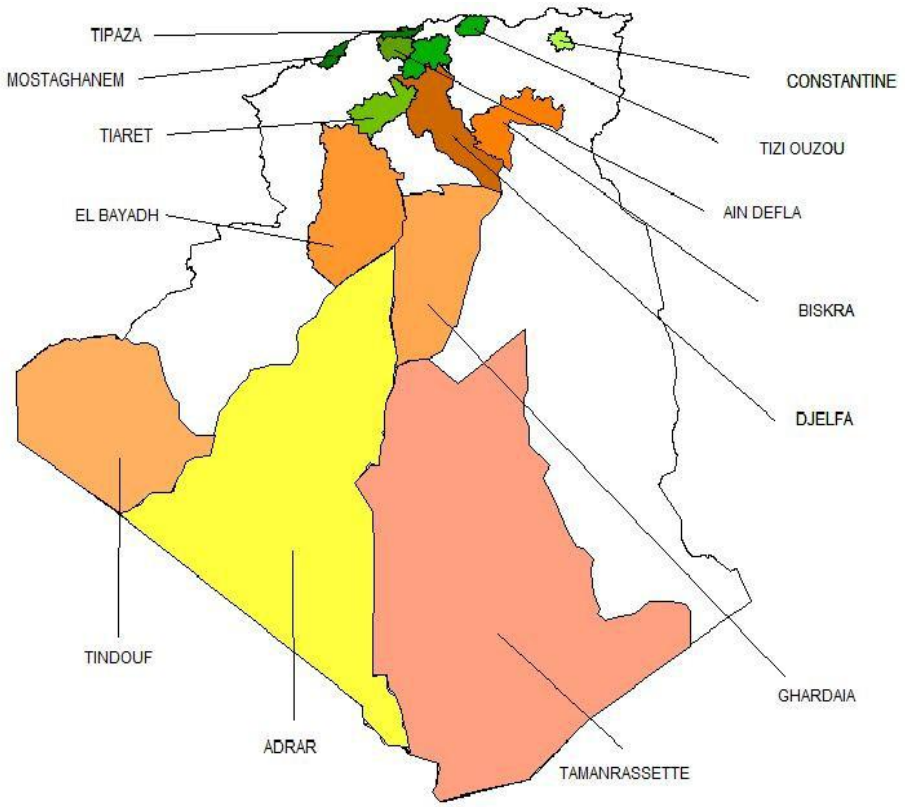

Fig.1. Mapping of the study areas in Algeria

The study involved the following areas: we mention in wilayas study: Tipaza, Constantine, Mostaganem, Tizi-Ouzou, Tiaret, Ain Defla, Biskra, El Bayadh, Ghardaia, Tindouf, Adrar and Tamanrasset, Oran, Medea.

RESULTS AND DISCUSSION

The use of spss software (PASW statistics 17) allowed us to estimate the difference between species (bovine, ovine, caprine) between the four years (2007.2008, 2009, 2010) and between organs, we have for bovine: hepatic hydatid cyst the average (65.65 to 64.79 - 69.37 to 24.76) during the four years it has almost the same share in 2010 and we noticed a drop in cases hydatidosis of the (P = .856) is significant compared to IC90% (52.28 to 79.01), (51.99 to 77.60), (55.63 to 83.11) (61, 76 to 83.39), respectively, with years of study, while the distribution of the samples was also significant that the (mean ± standard deviation) over the four years is almost the same for lung we recorded. the average prevalence of each year (47,62-56,76-58,92-56,20), with IC90% of (30.50 to 64.74, 38.78 to 74.74, 41.32 -76.52, 39.82 to 72.57) with P significant (P = 0.778),

Sheep on the average prevalence for lung is (76,93-72,47-68,79-75,53) and IC90% for the same years (from 65.83 to 88.04, 59.86 -85.08, 55.33 to 82.25, 64.08 to 86.10), with (P = 0.763), the liver we recorded annual average (65.65 to 64.79 - 69 37 to 71.46), with IC90%, respectively, with years of study (from 52.28 to 69.01, 51,10-77,60,69, 55.63 to 83.11, 59.52 to 83 39), which gave a value (P = .856) is not significant. Finally, for the goats the average prevalence of pulmonary hydatidosis (43,17-25,79-32,09-36,99) respectively over the years (07-08-09-2010), the IC90% (25, 30 to 61.04, 9.65 to 41.92, 14.22 to 49.96, 19.94 to 54.04) with (P = 0.494) and for hepatic hydatid cyst we have almost the same average for four years (from 44.30 to 36.78 - 35.34 to 42.32) and IC90% (from 24.28 to 64.32, 19.36 to 54.20, 17.34 to 53.34, 24 0.25 to 60, 39) with (P = 0.867), a P not significant.

Hydatid cyst in Algeria continued to wreak havoc on livestock and has been for several years, it is a serious economic and public health (Bardonnet K. et al., 2003), the cycle between sheep and the dog is still considered the major source of human infection especially by the species Echinococcus granulosus (Pandey et al., 1988, Bahia, 1997), while the rest of the species is not yet known (Bardonnet K. et al., 2003). The Algerian press whenever the feast of aid el Kebir approach has a major role in the transmission of news from the Department of Health and Hospital Reform (the tribune 2008). The hydatid cyst is rampant in our country so endemic and constitutes a major health problem that has shown (the Maghreb in 2007), while the (Quotidien d'Oran in 2012) Clarified before Eid al-Adha , a few days, the direction of the Health and agricultural Services have jointly launched a reminder of some basic facts about the cyst and simple to take preventive measures to avoid the spread on a larger scale of this parasitosis. (News 2010) shows attention to hydatid cyst also said that she wrote the factors conducive to the spread of hydatid cyst met in Algeria. To prevent the spread of this serious disease, it is necessary to make some common precautions necessary during the ceremony of sacrifice sheep (the Midi Libre 2007) said that the hydatid cyst is endemic in Algeria and is a major public health. Hydatid disease is a parasitic disease of herbivores (mainly sheep) caused by a parasite called Echinococcus granulosus.

Algeria takes into account the danger of hydatid cyst that religious festival that gives people ignorant to believe that there is a cyst once in the year and also leaves the persistence and survival in an endemic state, the numbers obtained in our work are really

afraid, this transmission dynamics of E. granulosus may be related to the combination of immune factors, environmental and socio-ecological, the latter being related to farming practices, the behavior of hosts, lifestyle human and parasite control measures (Gemmel et al. 2001), highlighting the socio-ecological risk is not easy, first because of the importance and significant variation in the asymptomatic period. Evaluated on average 5 to 15 years (Rog Yang et al., 2006), this period may be reduced to a few months, some infestations remaining Conversely, asymptomatic throughout life (Pawlowski et al., 2001). Regarding socio-ecological hydatidosis (Dar el Alkarmi, 1997), they relate to various areas (house, outside the house, neighborhood, small region, country) whose characteristics - favorable or unfavorable to the disease - are difficult to assess and prioritize, which can vary over time. Nevertheless, slaughter practices family considered fairly stable within a household, appear constitute major elements of the risk of hydatidosis (Rausch, 1995). Cited by (KAYOUECHE Fatima Zohra2009).

Table 1

Prevalence of liver in cattle

prevalence liver / year / wilaya	Prev 2007	Prev 2008	Prev 2009	Prev 2010
Adrar	0	80	0	0
Aindefla	0,00%	0,00%	0	0
Biskra	50	30	40,18	27,22
Canstantine	85,71	40,83	99,09	85,91
Bayadh	0	18,18	10	30
Ghardaia	100	11,11	66,66	75
Medea	83,33	68,42	73,57	46,47
Mostaganeme	72,22	72,72	65,66	49,01
Tiaret	75,88	82,47	58,23	53,79
Tipaza	55,76	22,29	45,04	66,08
Tamenrasset	0	0	0	0
Tindouf	82,35	0	33,33	52,63
Tiziouzou	37,68	95,79	46,17	83,29
Bejaia	80,89	84,71	93,09	94,32
Bouira	95,38	93,94	80,22	80,33
Alger	99,22	93,19	94,5	93,72
Ouargla	97,46	87,39	76,38	92,95
Oran	73,58	60,16	90,81	81,61
el oued	81,63	80,28	86,77	68,72
AVERAGE	65,65	64,79	69,37	24,76
ECAR TYPE	27,73	26,56	28,50	24,76
STANDARD ERROR	6,36	6,09	6,53	3,04
IC95%	52,28-79,01	51,99-77,60	55,63-83,11	61,76-83,39
	P=0,856			

Some authors found a higher prevalence in sheep. In Africa Burkina Faso hydatidosis has been observed in cattle with a very low frequency (0.007%) (Coulibaly, 2000). Results are consistent with our work Seimenis (2003) who found a higher incidence sheep in Algeria (69.8%) for bovine our results are in contradiction with Azlaf and Dakkak (2006) have estimated the prevalence of hydatidosis in cattle in Morocco 3.98%, which explains that the maghebins prefer young meat consumption which explains affirms the work and Bussiera Chermette (1997) who say that the cysts grow in eight months,

according to (Jaim, 1984), the sacrifice of young sheep with age is less than 12 months are not hydatid cyst and are not visible to the inspection, for the goats finally our results are much lower compared to other species that goes with work (Sotiraki al., 2003) in Greece and Alloui (1997) in Algeria found a higher prevalence in sheep 5% against 4% in goats.

Table 2

Prevalence of bovine lung

prevalence lung / year / wilaya	Prev 2007	Prev 2008	Prev 2009	Prev 2010
Adrar	0	100	0	0
Aindefla	0,00%	0,00%	0	0,18
Biskra	85,71	94	98,13	91,81
Canstantine	99,8	99,38	87,83	97,61
Bayadh	0	90,9	50	80
Ghardaia	0	11,11	0	75
Medea	78,88	80,26	85	94,74
mostaganeme	42,73	95,95	99,14	77,47
Tiaret	76,59	78,35	85,29	91,03
Tipaza	78,84	89,8	85,58	89,56
tamenrasset	0	0	0	0
Tindouf	41,17	0	66,66	84,21
tiziouzou	90,43	57,64	99,21	44,26
Bejaia	40,9	19,18	53,68	25,3
Bouira	70,68	60,2	43,8	45,27
Alger	50,53	45,75	85,55	56,07
Ouargla	35,21	41,26	32,16	48,89
Oran	28,3	28,81	64,91	37,57
el oued	12,24	85,91	82,64	28,86
Average	**47,62**	**56,76**	**58,92**	**56,20**
ecar type	**35,52**	**37,30**	**36,51**	**33,96**
standard error	**8,14**	**8,55**	**8,37**	**7,79**
ic95%	**30,50-64,74**	**38,78-74,74**	**41,32-76,52**	**39,82-72,57**
	P=0,778			

Table 3

Prevalence of sheep lungs

PREVALENCE LUNG / YEAR / WILAYA	Prev 2007	Prev 2008	Prev 2009	Prev 2010
ADRAR	83,33%	99,81%	86,03	83,78
AINDEFLA	23,2	12,56	8,46	16,31
BISKRA	98,16	99,04	74,23	96,74
CANSTANTINE	99,73	99,37	3,98	98,35
BAYADH	83,44	99,08	89,84	95,55
GHARDAIA	99,9	90,04	99 ,50	94,59
MEDEA	92,07	96,74	94,34	95,22
MOSTAGANEME	93,35	99,85	90,82	91,06
TIARET	92,38	78,99	89,45	92
TIPAZA	79,12	79,55	83,72	95,68
TAMENRASSET	78,21	51,75	62,22	53,54

TINDOUF	88,46	56	54,71	63,63
TIZIOUZOU	80,62	47,06	67,87	41,97
BEJAIA	65,88	50,5	63,28	44,41
BOUIRA	40,33	54,58	90,18	67,11
ALGER	78,15	66,3	54,04	75,48
OUARGLA	57,19	99,05	81,82	81,29
ORAN	95,89	43,28	81,53	93,22
EL OUED	32,39	53,47	31,11	55,29
AVERAGE	**76,93**	**72,47**	**68,79**	**75,53**
ECAR TYPE	**23,03**	**26,16**	**27,92**	**23,76**
STANDARD ERROR	**5,28**	**6,00**	**6,40**	**5,45**
IC95%	**65,83-88,04**	**59,86-85,08**	**55,33-82,25**	**64,08-86,10**
	P= 0,763			

Table 4

Prevalence of sheep livers

PREVALENCE LIVER / YEAR / WILAYA	**Prev 2007**	**Prev 2008**	**Prev 2009**	**Prev 2010**
ADRAR	99,76	66,54	99,47	97,16
AINDEFLA	15,59%	12,49%	6,73	16,21
BISKRA	51,83	27,3	98,98	35,95
CANSTANTINE	47,7	71,56	99,02	68,23
BAYADH	56,95	50,49	76,56	74,81
GHARDAIA	32,44	43,87	80,84	48,08
MEDEA	32,3	37,25	43,02	45,63
MOSTAGANEME	45,63	35,38	37,48	74,14
TIARET	75,06	77,2	55,1	61,14
TIPAZA	55,5	35,84	33,28	55,59
TAMENRASSET	91,08	87,71	77,77	92,35
TINDOUF	96,15	56	66,03	45,45
TIZIOUZOU	22,15	95,26	24,5	97,36
BEJAIA	82,02	89,02	87,55	90,46
BOUIRA	74,78	91,16	64,85	88,81
ALGER	97,84	98,34	84,94	95,77
OUARGLA	98,77	89,86	98,22	97,69
ORAN	86,78	78,93	98,92	98,56
EL OUED	85,07	86,94	84,89	74,36
AVERAGE	**65,65**	**64,79**	**69,37**	**71,46**
ECAR TYPE	**27,73**	**26,56**	**28,50**	**24,76**
STANDARD ERROR	**6,36**	**6,09**	**6,53**	**5,68**
IC95%	**52,28-69,01**	**51,10-77,60**	**55,63-83,11**	**59,52-83,39**
		P=0,856		

Table 5

Prevalence of lung goats

PREVALENCE LUNG / YEAR / WILAYA	prev 2007	Prev 2008	prev 2009	prev 2010
ADRAR	0	50	0	40
AINDEFLA	0,00%	0,00%	0	0
BISKRA	0	0	2,54	4,54
CANSTANTINE	0	0	0	100
BAYADH	76,29	85,02	97,04	81,94
GHARDAIA	57,14	29,15	0	65,15
MEDEA	35,95	29,87	40,16	35,59
MOSTAGANEME	39,34	23,52	83,33	65,21
TIARET	57,8	11,36	53,44	35,84
TIPAZA	60	25,51	25,32	16,24
TAMENRASSET	100	100	0	0
TINDOUF	0	0	0	0
TIZIOUZOU	77,77	0	20,66	0
BEJAIA	84,87	89,98	90,84	94,35
BOUIRA	89,51	0	0	0
ALGER	0	1,96	0	0
OUARGLA	72,72	0	41,66	29,16
ORAN	0	0	62,5	71,42
EL OUED	68,96	43,68	92,3	63,44
AVERAGE	**43,17**	**25,79**	**32,09**	**36,99**
ECAR TYPE	**37,08**	**33,47**	**37,07**	**35,37**
STANDARD ERROR	**8,50**	**7,68**	**8,50**	**8,11**
IC95%	**25,30-61,04**	**9,65-41,92**	**14,22-49,96**	**19,94-54,04**
	P=0,494			

Table 6

Prevalence of liver goats

PREVALENCE LIVER / YEAR / WILAYA	prev 2007	Prev 2008	prev 2009	prev 2010
ADRAR	0	50	0	20
AINDEFLA	0,00%	0,00%	0	0
BISKRA	0	0	95,45	95,45
CANSTANTINE	0	0	0	100
BAYADH	13,33	66,84	27,67	49,16
GHARDAIA	97,61	49,81	0	81,81
MEDEA	86,9	85,28	59,83	68,81
MOSTAGANEME	91,8	88,23	66,66	43,47
TIARET	76,98	20,45	71,14	76,98
TIPAZA	88,75	73,46	97,4	72,29
TAMENRASSET	100	0	0	0
TINDOUF	0	0	0	0
TIZIOUZOU	77,77	0	96,66	0
BEJAIA	61,11	53,88	62,01	58,47

BOUIRA	0	45,21	0	0
ALGER	79,72	72,54	0	0
OUARGLA	48,48	0	37,5	72,91
ORAN	0	0	37,5	0
EL OUED	19,31	93,2	19,78	64,82
AVERAGE	**44,30**	**36,78**	**35,34**	**42,32**
ECAR TYPE	**41,53**	**36,13**	**37,34**	**37,48**
STANDARD ERROR	**9,52**	**8,29**	**8,56**	**8,60**
IC95%	**24,28-64,32**	**19,36-54,20**	**17,34-53,34**	**24,25-60,39**
	P=0,867			

To the affected organs we noted that the frequency of liver damage is dominant compared to the bovine lung which is in contradiction with Capuano et al. (2006) who found a frequency of 7.81% against 4.83% lung liver with same work Bardonnet et al. (2003) in Algeria, Phiri (2006) in Zambia and Esatgil Tüzer (2007) in Turkey, and even Ansari-Lari (2005) in Iran and Eckert et al. (2001b). For sheep we had almost close results, the prevalence of lung remains dominant as the liver over the four years of study which is consistent with the results of (KAYOUECHE Fatima Zohra2009) and Ansari-Lari (2005) , and Azlaf Dakkak (2006), and in contradiction with Esatgil and Tüzer (2007) and Arbabi and Hooshyar (2006) who found a predominance of hepatic hydatidosis.For the goat we found a dominance of the liver in terms of average years of this study which is in contradiction with (KAYOUECHE Fatima Zohra2000) with (5.85%) for the lung against 3, 55% for liver and is consistent with Azlaf and Dakkak (2007) who found that the liver is the organ most affected.

CONCLUSIONS

To prevent the progression of hydatid cyst in Algeria, it is necessary to walk a mechanism for control and prevention established with the collaboration of doctors and veterinarians and communicated through the press and regular manual are well organized in time and not just once or twice in the year it is a disease that changes in prevalence between regions of the same country, and between countries and continents, through several factors, be careful and follow the instructions carefully established by the ministry of health and of agriculture.

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