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BRACHYLAEMUS FLEURYI FONS., 1939 (*FASCIOLOIDEA. BRACHYLAEMIDAE*)

BY

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In a preliminary note (1) we had the opportunity to describe as a new species a *Brachylaemus* found in the *coecum* of a hen in São Paulo, Brazil.

A revision of previous works on the genus *Brachylaemus* DUJARDIN, 1843, syn. *Harmostomum* BRAUN, 1899, seems to justify our procedure, showing the uncertainty that prevails about the value to be ascribed to a large number of species of this genus.

The disparity of opinions about the autonomy of most of the forms known is such, that some modern specialists, as Witenberg (2), point out numerous species as good ones, whereas others, such as Sinitsin (3), restrain the genus to a minimum of valid units, and sink the majority as synonyms. Others, as Dollfus (4), hold an intermediary position, considering the diversity of the hosts as well as the geographic distribution as elements that contribute for a specific or sub-specific distinction.

Such a diversity of conception of specific characteristics among specialists with large experience in the group, shows that the researches about the limits of the morphologic variations are still incomplete among species of *Brachylaemus*. Unless they present very typical features, differentiation will continue to be difficult and only a future comparative study will permit to remove these difficulties and to decide about the value to be ascribed to each of the morphologic variations used nowadays as elements for the specific distinction.

Characters of **Brachylaemus fleuryi**

Fascioloidea, Brachylaemidae, of elongated shape with rounded extremities, measuring 5440 - 6760 μ in length by 2205 - 2440 μ at the widest point, somewhat depressed at the height of the acetabulum. Oral sucker subterminal, measuring 735 - 823 μ in length by 882 - 1029 μ in width. Acetabulum pre-equatorial, wider than long, 646 - 735 μ in length by 850 - 940 μ in width. The acetabulum divides the body in the ratio 1:2.5 - 1:3.5 (*). The distance from the posterior margin of the oral sucker to the anterior margin is 823 - 1225 μ. The oral sucker is followed by a very strong pharynx, measuring 470 - 588 μ in length by 440 μ in width, which, in contraction, has measured in a specimen 323 μ in length by 970 μ in width. It was not possible to verify the existence of an oesophagus because this region is covered by uterine loops, in the holotype, as well as in the paratypes which are used in the present description. The *coeca,* difficult to examine because they are covered almost over the whole extension by the uterine coils, proceed first anteriad and then posteriad, their fields matching in front that of the vitellaria; the course is very sinuous, ending at the posterior extremity. The aspect of the intestine and of the uterus approaches the species to the sub-genus *Postharmostomum* WITENBERG, the validity of which, besides, has been doubted by various specialists.

Testicles situated almost entirely in the posterior quarter of the body, the anterior with 646 - 940 μ of antero-posterior length by 735 - 1235 μ at the widest point, and the posterior, which is slightly lobated, 529 - 588 μ in length by 937 - 1176 μ in width. The cirrus pouch is less pronounced and of pre-testicular situation.

The ovary is placed at the right side of the anterior testicle not surpassing the median line, of almost oval shape, and measures 323 - 494 μ antero-posteriorly by 411 - 499 μ at the widest point.

Submarginal vitellaria starting from almost the middle of the acetabulum (at the right side of the holotype) or from its posterior margin, up to the anterior margin of the posterior testicle. Vitelloducti converging between the two testicles, with a left more calibrous branch. The uterus seems to present the aspect attributed to the sub-genus *Postharmostomum* WITENBERG, with very sinuous loops that proceed anteriad, at the dorsal side, up to the heigth of the pharynx, then turning back, at the ventral side up to the level of the cirrus pouch, ending in a short, slightly curved metraterm. Genital orifice pre-testicular, at the level of the cirrus pouch. Eggs very numerous sized 31 × 15 μ.

Description from the holotype and two paratypes, caught in the *coecum* of a hen in São Paulo, Brazil, by Mr. Carlos Toledo Fleury.

DISCUSSION

The species described up to the present in Brazil are so different from *Br. fleuryi* that, even admitting the restrictive criterion of Sinitsin, it would not be possible to identify it with any one of the species reported from the neotropic region.

(*) The proportion 1:5 referred in the original description evidently is an erratum, and should be changed to 1:2.5, which is the correct one.

It would be difficult to believe, *a priori*, in an identity with *Br. opisthotrias* (LUTZ, 1895), which, besides, occurs also in São Paulo, on account of the diversity of the zoological situation of the hosts, the species of Lutz being a parasite of a marsupial, *Didelphys aurita*. Morphological differences are, however, marked enough to avoid the necessity to apply such a criterion. Really, the dimensions and shape of the oral sucker, acetabulum, pharynx, testicles and the small lateral development of the uterine loops, distinguish it immediately from *Br. fleuryi*. The level reached by the vitellaria, considered by the majority as a constant character, varies in *Br. opisthotrias*, going from the posterior margin up to the middle of the acetabulum, according to Dollfus, who examined and figured material of Lutz.

From three other Brazilian species, *Br. marsupium* (BRAUN, 1901), parasite of *Odontophorus guajennensis*, syn. *Perdix rufina*, *Br. mordens* (BRAUN, 1901), caught on *Rallus* sp., and *Br. centrodes* (BRAUN, 1901), which has as hosts several birds of the genera *Tinamus* and *Crypturus*, as well as *Nothura maculosa*, *Br. fleuryi* is distinguished by the anterior situation of the vitellaria, which in *Br. fleuryi* reach, at the maximum, but the middle of the acetabulum, this level being surpassed in the three species mentioned. Besides, the size of the ovary in *marsupium* resembles that of the testicles; in *mordens* the uterus reaches only the acetabulum, the oral sucker being different; and in *centrodes* the cirrus is spinous.

It is distinguished from *Br. mazzantii* (TRAV., 1927), parasite of *Columba livia domestica* and of *Columbigallina talpacoti* from Brazil, by the much smaller size of the oral sucker and acetabulum, the distance between these, the size and shape of the pharynx, testicles and ovary, the position of the ovary, which surpasses the median line in *Br. mazzantii*, the situation of the genital pore, which in *mazzantii* lies in the field of the anterior testicle, the anterior limit of the vitellaria which in *mazzantii* reaches the bifurcal zone. Besides, the *coeca* in *mazzantii* are almost straight and the uterus has the situation which was described for the sub-genus *Harmostomum* by Witenberg.

This way, the hypothesis that the species of *Gallus domesticus* described by us may be identical to any other one occurrent in Brazil is removed, there existing no record of other neotropic species.

Of North American species are known the following: *Br. virginianus* (DICKERSON, 1930), [syn. *H. migrans* (DUJARDIN), *H. recurvum* (DUJARDIN), *H. spinulosum* (HOFMA.), *H. equans* LOOS, *H. opisthotrias virginianus* DICKERSON], species which recalls *Br. opisthotrias* LUTZ, being distinguished from *Br. fleuryi* by the smaller size; *Br. peromysci* REYNOLDS, 1938, the acetabulum of which divides the body in the ratio 1:6; *Br. laruei* (MCINTOSH, 1934), parasite of the rodent *Tanias striatus lysteri*, the vitellaria of which reach the posterior margin of the pharynx; *Br. pellucidus* (WERBY, 1928), parasite of *Planesticus* *migratorius propinquus*, immediately distinguished by the oral sucker which is smaller than the acetabulum.

It is more important to establish the differential diagnosis between *Br. fleuryi* and the species already appointed from *Gallus domesticus* in Europe, Africa and Asia. They are:

Brachylaemus annamensis (RAILLIET, 1924)

Brachylaemus commutatus (DIES., 1858)

Brachylaemus hawaiiensis (GUBERLET, 1928)

Brachylaemus horizawai (OSAKI, 1925)

Brachylaemus gallinus (WITENBERG, 1923)

Br. annamensis has smaller size for the acetabulum, the vitellaria only reach the genital orifice, the eggs are smaller.

Br. commutatus has round oral sucker and smaller acetabulum; the vitellaria start at the level of the bifurcal area. According to Joyeux, the testicles and suckers should be much smaller. Only Dollfus indicates a reference of Joyeux *in literis*, pointing out *Br. commutatus* with oral sucker of 600 μ and even 800 μ, in material from *Meleagris gallopavo*, of Hawaii, and of *Numida meleagris*, of Tunis. Sinitsin believes that this is the only valid species parasitic on hens, sinking therefore all others as synonyms of his *Post harmostomum commutatum*.

Br. gallinus has much smaller oral and ventral suckers and circular acetabulum, dividing the body in the ratio 1:2, whereas in *Br. fleuryi* the ratio varies between 1:2,5 and 1:35; the pharynx has smaller size, the vitellaria reach at the back only the anterior margin of the anterior testicle and the genital orifice lies in the testicular area; the eggs are wider.

Of *Br. horizawai* the large eggs, 35-38 μ × 21-22 μ, distinguish it sufficiently.

Of *Br. hawaiiensis* it is distinguished mainly by the size of the oral sucker and the acetabulum, which are, besides, almost circular, and by the diversity of the size of the testicles and ovary.

By what can be deduced from the description of the authors who admit the separation of the five species already described as parasites of *Gallus domesticus*, none of these descriptions agrees with that of the species found by us, the sizes of which are generally larger than those of any other species.

Dollfus in his monography of 1935 admits only the sub-specific category for the *Brachylaemus* of domestic *Galliformes*, recognizing, therefore, three subspecies: *Br. commutatus commutatus*, *Br. commutatus annamensis* and *Br. commutatus gallinus*; *Br. horizawai* and *Br. hawaiiensis* are considered synonims of *Br. commutatus gallinus*. *Br. commutatus commutatus* should occur only in Europe; *Br. commutatus gallinus*, distinguished owing to the vitellaria which do not surpass the level of the posterior margin of the acetabulum, should exist in Africa, Asia and Hawaii, and *Br. commutatus annamensis* in Hue, in the Annam.

If the criterion of Dollfus, who considers also the host and the geographic distribution, is admitted, the species which we are describing would approach rather *gallinus*, not only due to its large geographic distribution, but also on account of the anterior level of its vitellaria, which are more or less coincident and due to the fact that both present characters which are common to the sub-genus *Postharmostomum* WITENBERG. Owing to the differences between these two species, which were already pointed out, we are not allowed, at present, to identify them.

Other species, the descriptions of which were compared, by the original or by means of references, as *B. furcatus* (RUD.), *B. inflatocoelum* (WITENBERG), *B. spinulosus* (HOFM.), *B. helicis* (MECKEL), *B. equans* (LOOS), *B. mesostomus* (RUD.), *B. nicolli* (WIT.), *B. arcuatus* (DUJ.), *B. attenuatus* BAER and *B. erinacei* (BLANCH), all differ from *Br. fleuryi* by morphological characters, to which should be added also the zoogeographic data.

CONCLUSION

The species of the genus *Brachylaemus* caught on hen and described as *Brachylaemus fleuryi* FONSECA, 1939, in São Paulo, Brazil, does not agree with the description of any one of the species of the genus referred up to the present, approaching, however, *Br. gallinus* (WITENBERG, 1923), being distinguished by the size of the oral sucker and acetabulum, which are much larger, by the shape of the acetabulum, which is elliptic, by the size of the pharynx, by the situation of the genital orifice and by the size of the eggs.

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