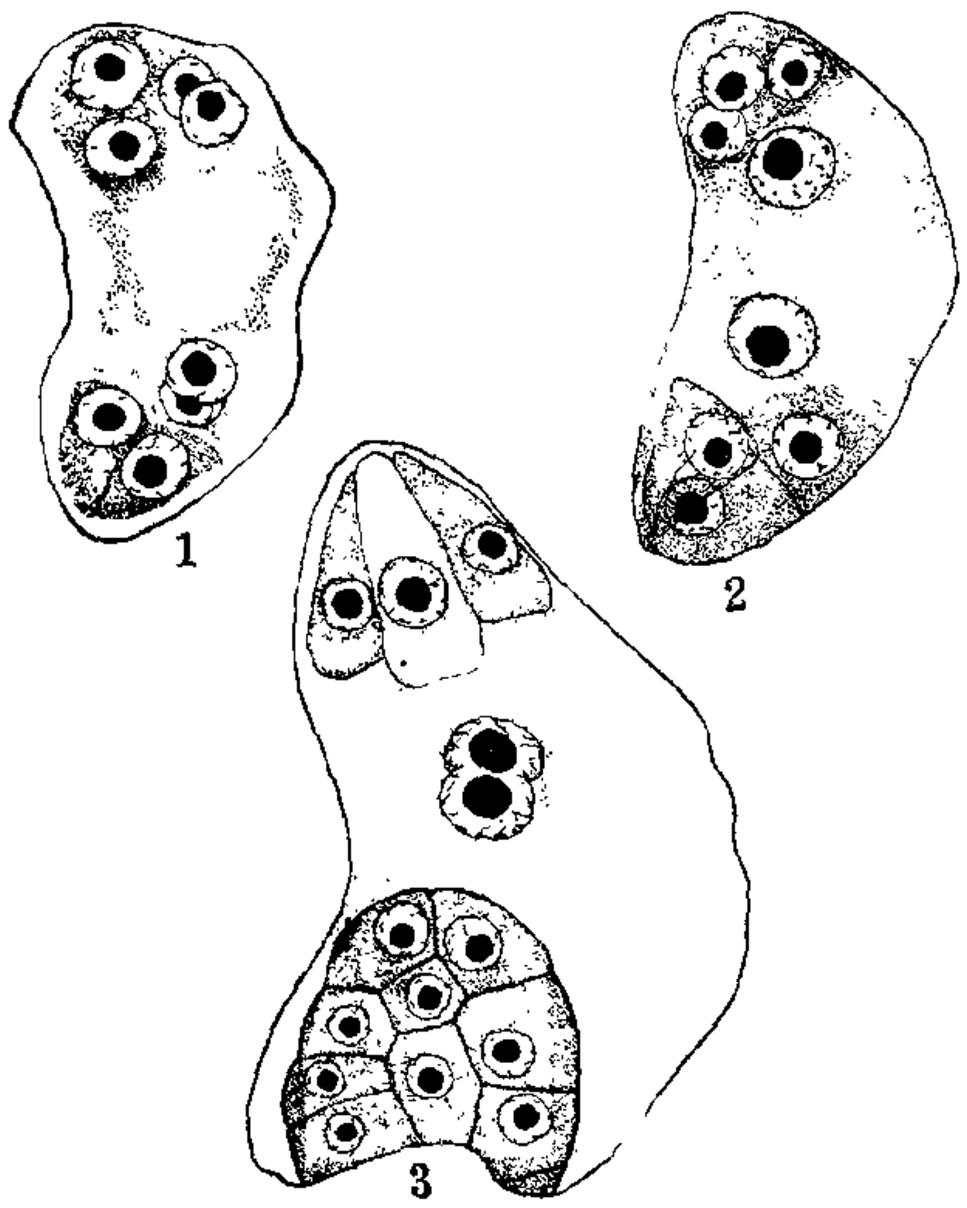
as has been described by Stover (1937). As he has already recorded, the primary archesporial cell does not cut off any parietal cell, a T-shaped tetrad of megaspores results after the reductional divisions; the lowermost megaspore develops further. Upto the third division of the megaspore nucleus Stover's observations are in agreement with those of the writer.

Soon after the formation of four nuclei at each pole of the embryo-sac, one can see the characteristic large vacuole separating the two groups of nuclei. First, the plasma around the two nuclei lying nearest to the chalaza becomes dense and soon gets separated as two antipodal cells. When this is complete, a similar phenomenon is seen in relation to two of the nuclei at the micropylar end also. Fig. 1 represents the embryo-sac at about this stage. At



FIGS. 1, 2 and 3. × 480. For explanation see text.

a slightly advanced stage, only one of the other two free nuclei of the chalazal group becomes embedded in dense plasma, and the other nucleus remains free and slightly increases in size. This process repeats more or less simultaneously at the micropylar end also and the nucleus thus separated becomes conspicuous by its slightly enlarged size (Fig. 2). These two free nuclei, one at each pole of the embryo-sac, constitute the respective polar nucleus. They move towards each other until they unite and fuse (Fig. 3). The fusion is completed before fertilization and the fused diploid nucleus lies nearer to the egg apparatus. The remaining three nuclei at the micropylar end becomes organised into two typical synergids and one egg. The egg is slightly larger and possesses a similar nucleus.

The nuclei of the three antipodal cells, soon after their formation, undergo prophasic changes for further divisions. Stover observed that only one or two of the antipodal cells divided further resulting in five or six cells. The present investigation, however, clearly shows that all the three antipodal cells take part in increasing the number of antipodal cells. Most of the mature embryo-sacs showed as many as twelve cells forming a compact mass (in Fig. 3 only nine such cells are shown, as the other three cells were in the next serial section of the slide). This mass of antipodal tissue degenerates after fertilization.

It will be evident from the preceding account that the development of the embryo-sac in *Eragrostis cilianensis* (All.) Link., is quite typical, except for an increase in the number of the antipodal cells which is a dominant tendency among the members of the family. Hence, Stover's claim, that the organisation of the embryo-sac in this plant "is a new type not only for the grasses but for all plants", becomes invalid.

Basavangudi,
Bangalore,
March 14, 1944.

B. G. L. SWAMY.

Maheshwari, P., *Jour. Ind. Bot. Soc.*, 1941, **20**, 229–61. Stover, E. L., *Chio. Jour. Sci.*, 1937, **37**, 172–84.

A NEW AMPHIBIAN TRICHOSTRONGYLID

TRICHOSTRONGYLIDS which form an important group of Nematodes are of rare occurrence in the Amphibia. The well-known genus *Oswaldocruzia* has been described from several parts

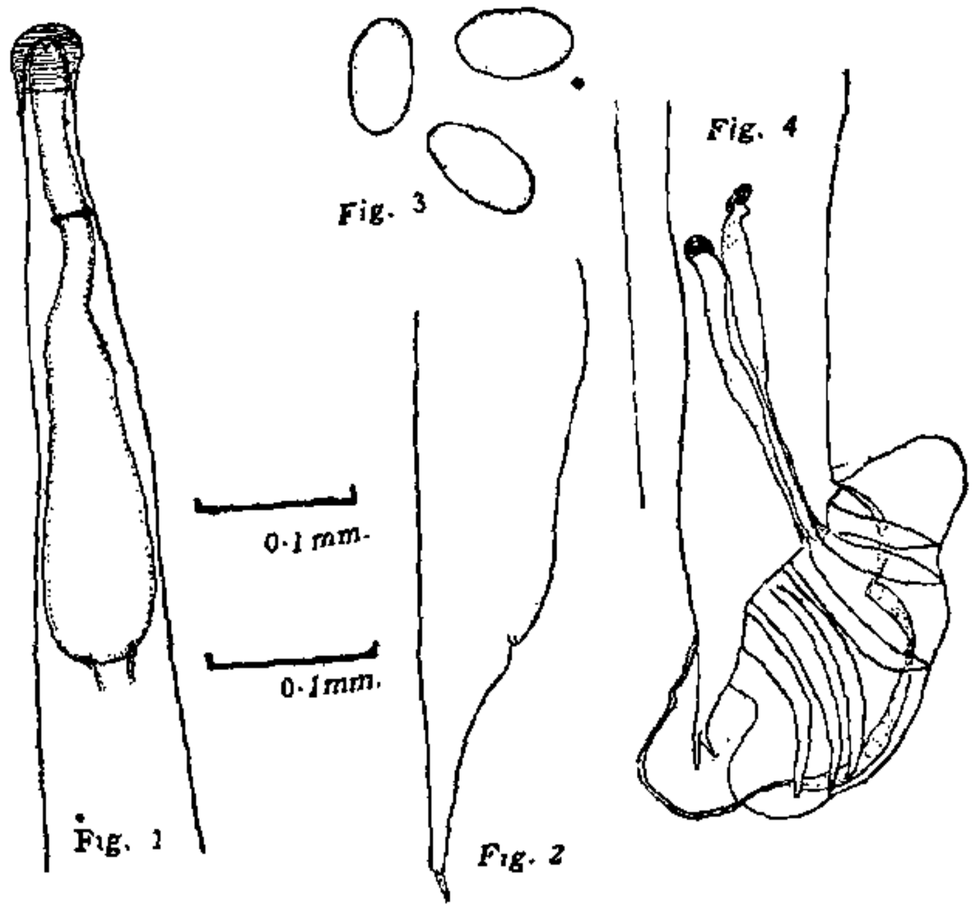


FIG. 1. *Oswaldocruzia indica* n. sp. Female, anterior end.

FIG. 2. *Oswaldocruzia indica* n. sp. Female, posterior etd.

FIG. 3. Eggs of *Oswaldocruzia indica.*

FIG. 4. *Oswaldocruzia indica* n. sp. Male, posterior end showing spicules and bursal rays

of the world from amphibian hosts but in India its occurrence was not reported till 1942[1]

when the writer obtained a few specimens of *Oswaldocruzia* from the intestine of the common toad, *Bufo melanostictus* at Lucknow. Further search for these parasites was continued and the genus *Oswaldocruzia* is now being reported from *Rana cyanophlyctis* as well, although the frequency and percentage of infection in both *Bufo* and *Rana* are extremely low.

The worms are very thin and white or whitish-grey in colour, and do not show great mortality in life. The head has a distinct cuticular inflation which shows transverse striations. The lateral membranous wings are absent. The cervical papillæ are present. The following table gives the measurements (in millimeters) of the male and female specimens:—

	Male	Female
Length ..	4·9	10·9
Width maximum ..	0·1	0·23
Head inflation length ..	0·03	0·05
Œsophagus length ..	0·3	0·42
Head nervering distance	0·12	0·135
Anus tail (including spike) distance ..		0·18
Vulva tail distance ..		3·8
Spicule length ..	0·22	
..	0·20	
Eggs	0·075 — 0·08 × 0·04 — 0·05	

Host: *Bufo melanostictus; Rana cyanophlyctis.*
Locality: Lucknow, U.P., India.

Discussion

The genus *Oswaldocruzia* was erected by Travassos (1917)[2] and since then quite a large number of species have been added to the genus. Recently Walton (1938)[3] gave a summary of various amphibian species of this genus. Later Freitas and Lent (1938)[4] described one species from Rio de Jenero, Brazil; and Koo (1939)[5] added another species from Canton, China. The genus was split up into two sub-genera *Oswaldocruzia* and *Bialata* by Morishita (1926)[6] on the basis of the presence or absence of lateral membranous wings although this distinction has not been rigidly followed by later workers. The important amphibian species[7] of the sub-genus *Oswaldocruzia* are as follows:—

1. *Oswaldocruzia (Oswaldocruzia) filiformis.*
2. „ „ hoepplii.
3. „ „ leidyi.
4. „ „ mazzai.
5. „ „ *waltoni.*
6. „ „ lopesi.
7. „ „ *heparia.*
8. „ „ subauricularis (Type species).

The present form does not bear lateral expansions of the body and hence may be put under the sub-genus *Oswaldocruzia (Oswaldocruzia)* according to Morishita. It differs from the species *heparia, hoepplii, mazzai, waltoni, leidyi* and *lopesi* in having much larger spicules in the male in proportion to the size of the body and also in the size of the eggs and the œsophagus. The present form comes nearest to the species *filiformis* and *subauricularis* but from both these it differs in the shape of the spicule and the dorsal ray and in having smaller eggs. It is, therefore, regarded as a new species to which the name *Oswaldocruzia (Oswaldocruzia) indica* is given.

Lucknow University, M. B. Lal.
February 2, 1944.

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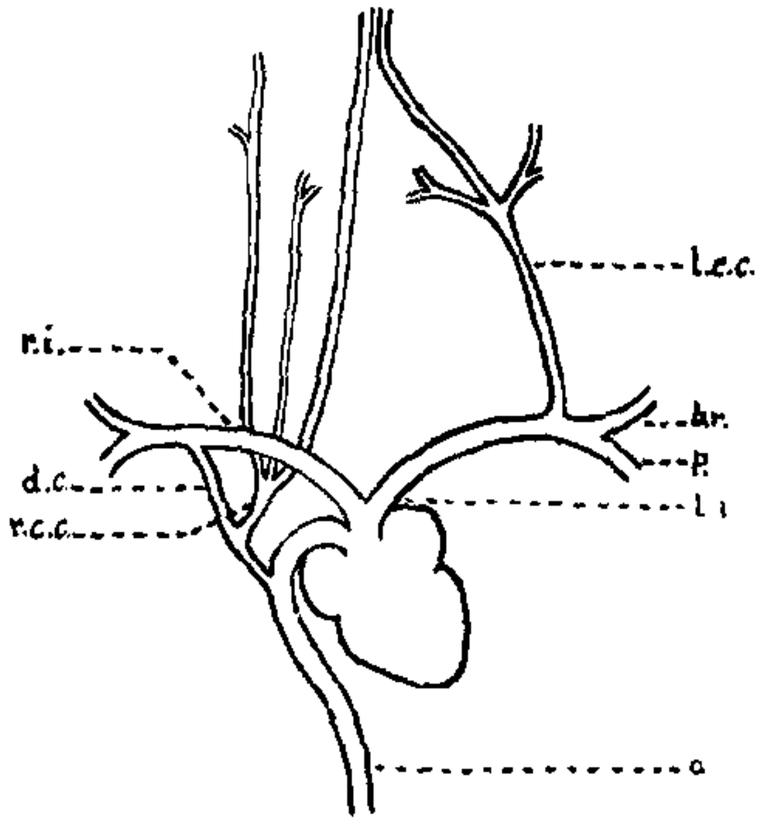
1 Lal, M. B., *Curr. Sci.*, **1942, 2,** No. 8. (One species from Nicobar islands was described by Baylis and Daubney, *Rec. Ind. Mus.* Calcutta, **1923, 25**). 2. Travassos, *Braz. Medic.*, **1917 31.** 3 Walton, *Trans. Amer. Micros. Soc.*, **1938**, 57–(1). 4. Freitas and Lent, *Mem. Inst. Oswal. Cr.*, **1938**, Tom. **33**, Fas. **4.** 5 Koo, *Ling. Sci., Jour.*, **1939, 18,** No 2. 6. Morishita, *Jour. Fac. Sci. Imperial Uni. Tokio*, 1926, **1,** part I, 7. Travassos, *Mon. Inst. Oswal. Cr.*, **1937, 1–vii.**

PERSISTANCE OF DUCTUS CAROTICUS AND THE UNUSUAL ORIGIN OF THE RIGHT COMMON CAROTED IN THE PIGEON

An unusual abnormality was noticed by me in a dissection of the pigeon which is worth recording for its rarity. Previous records of abnormalities in the arterial system of birds including pigeon relate to the persistence on the right side, of a vessel, the ductus caroticus connecting the common carotid artery with the systemic or aortic arch. These are all obviously cases of a persistent embryonic condition in the adult.

In the specimen of pigeon dissected by me, while the ductus caroticus persisted as in the previous cases recorded, the common carotid of the right side, instead of arising as in those



Ventral view of the arterial arches of pigeon
br.—brachial artery; *d a.*—dorsal aorta; *d.c.*—ductus caroticus; *l.c.c.*—left common carotid artery; *l.i.*—left inromirate, *p.*—pectoral artery; *r.c.c.*—right common carotid artery; *r.i.*—right inromirate.

cases from the innominate (Brachiocephalic), was given off from the ductus. From the ductus