Cordyceps sphecocephala is perhaps endemic to the West Indies on wasps. About 190 years ago Father Torrubia noted this species from Cuba. It was supposed that such species as *C. sphecocephala* was a mutation of an animal into a plant[3].

Massee[5] recorded the distribution of the species from Jamaica, Cuba, St. Vincent and Brazil. According to Llyod[4] the species has also been recorded from Feldkirch in Austria, and that Quelet noted it from France.

Koltzsch first proposed the names of the species as above which was retained for sometime without change. But in the *Fungi of Cuba* Berkeley spelled the species as *C. sphecophila*, and under this erroneous spelling it is compiled in Saccardo[3]. But Massee[5] in his revision of the genus *Cordyceps* and very recently Kobyasi[2] in his monograph on the genus retained the original name.

The hyphæ within the host form a sclerotic fleshy deposit, often having cottony outgrowths, usually thinwalled, 3 μ—7·5 μ thick, granulated inside, sometimes branching, often with swollen tips, producing oval or conical or like cells, singly or in chains, measuring 11·5 μ–22·5 μ × 8 μ–12·5 μ.

The stroma usually arise from the upper part of the host, very rarely from abdomen, leathery-fleshy, 2-4 cm. long, consisting of a slender, sterile stipe and a fertile head; stipe, simple, pale-yellow, fibrous, often 0·5-1 mm. thick; head elongated, usually clavate when mature, sometimes fusiform, upto 9 mm. long, 1-1·5 mm. thick.

The hyphæ composing the stipe are usually thin walled, transversely septate, 3·5 μ–7·5 μ thick, sometimes a few hyphæ produce somewhat swollen tips; the hyphæ between the perithecia are crossed loosely and irregularly, 2 μ–3 μ thick. The pseudoparenchymatous wall is composed of usually several layers of oval rounded cells, 5·5 μ–12 μ across.

The perithecia are very prominent, completely and obliquely immersed, in the form of an ampule 300 μ—1000 μ long, 200 μ–300 μ broad, neck elongated ostiole not very clear. The asci upto 650 μ or more long, uniformly narrow, 6-7·5 μ broad, spores nearly as long as the asci, breaking into narrow fusiform segments 9μ—10μ long.

Host—*Pompilus* sp.

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STRUCTURE AND FUNCTION OF BURSA COPULATRIX AND THE ASSOCIATED ORGANS IN BRUCHIDAE (*LARIIDAE*) [COLEOPTERA PHYTOPHAGA] AND THEIR TAXONOMIC SIGNIFICANCE

IN the female genitalia of Bruchidæ, the bursa in *Bruchus phaseoli* Gyll., & *Bruchus analis* F., are elongated and somewhat saccular although in the latter case, it is considerably larger in size. The bursa in *Bruchus chinensis* L., *Bruchus affinis* Frol. and *Spermophagus convolvuli* Thunb., is somewhat smaller than the other two species mentioned above, the relative shape being variable among themselves. The wall of bursa in *B. phaseoli* and *B. analis* bear internally near about the middle a pair of prominent round cup-shaped structures. In the case of the latter species, however, it was found on dissection to be well developed lobular rather hollow structures attached to the wall, of the bursa and somewhat pale yellowish in colour (Fig. 3b), whereas in the case of *B. phaseoli*, they are smaller, transparent somewhat fixed organs. So far as available literatures are concerned, nothing definite is known about these peculiar structures or their

:unctions nor any homology is existing in)ther families. Although Zacher[3] is of opi- ıion that these organs function as accessory glands and secrete fluid for cementing the ›ggs, he concludes as follows which I quote: 'Die Bideutung ist nicht clar, da mir Ana- ogen bei anderen Familien nicht Bekannt ;ind". In my opinion as cement secreting ıccessory glands for fixing the eggs are se-)arate system of organs traceable in other ısects, they cannot possibly be lodged inside ıe bursa which has by itself a different func- ion altogether. Mukerji and Bhuya[1] men- ion that these structures function as valves ›ccluding the proximal vaginal part from he distal portion of the bursa and thus pre- 'enting, during copulation, further penetra- ion distad by the everted endophallic sac,* Moreover, the crenulated rim of these cup- haped structures their hollowness (Fig. 3*b*) ›gether with their natural position in the ursa do not seem to support this theory. 'hey can, however, only be partially occlu- .ve in function.

is comparatively smaller and the sperma- theca fairly developed, these paired struc- tures although less prominent than in the case of *B. analis,* function similarly.

It is therefore likely that each of these cup-shaped structures with opening on one side in the form of an arc, act as pouches for temporary storage of sperms ejected in the bursa just after copulation and subsequently releasing them slowly on a fold (Fig. 3 *f*) of the bursa to be collected slowly by the open- ing of the spermathecal duct (Fig. 3 *Sd.*).

In *B. analis* near about the level of the cup-shaped structures, there lies internally and mesially a longitudinal somewhat thickly chitinized plate which bears internally a series of curved spines. Its probable function appears to be to check the penetration of the endo- phallic sac or the internal sac of Sharp and Muir[2] beyond the cup-shaped structures. So far, this chitinized plate on the bursa has been traceable only in *B. analis* and is thus a specific character.

FIG. 1

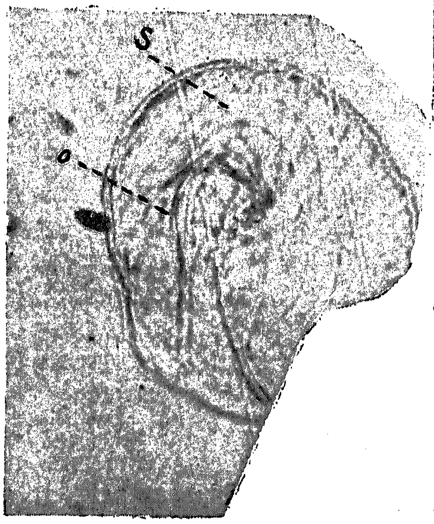

FIG. 2

FIG. 3

The shape structure and position of these gans in the bursa, in the absence of any her feasible explanation, gave evidence to e fact that they probably act as primary re- rviors of sperms as in the case of *B. analis* ıere the bursa is comparatively larger and eir spermatheca comparatively smaller in .e. In the other species, *e.g., B. phaseoli* ıere the condition is reverse, *i.e.*, the bursa

The spermatheca (Fig. 1) in Bruchidæ is a double chambered organ consisting of an inner chamber (*i.c.*) and an outer chamber (*o.c.*), the former being inserted into the latter. Into the inner chamber opens laterad, the duct of the accessory gland (*ad*) which pours its contents direct into it. The wall of the spermatheca forms the outerwall of the outer chamber while its innerwall is limited by the wall of the inner chamber (Figs. 1 & 2, *s*), leaving a definite lumen between them. Distally, the inner chamber is connected with the lumen of the outer chamber by an opening (Figs. 1 & 2, *o*). Basally, the spermathecal duct appears to consist of a double tube one inserted into another, the inner one being connected with the inner chamber while the outer one is continuous with the wall of the spermatheca at the base forming further distad the spermathecal duct. Functionally, when the muscles of the spermatheca contract and immediately relax, a partial vacuum is created inside the spermatheca and the released sperms rush through the outer ring at the base of the spermatheca (the inner ring remaining closed) and reach the lumen of the outer chamber. From the outer chamber they reach the inner chamber through the opening at (*o*). These sperms thus get mixed up with the secretions of the accessory gland and undergo necessary physiological changes in the inner chamber. Subsequently, when the wall of the spermatheca again contract the basal outer ring closes on the inner ring and the mature sperms are expelled from the inner chamber through the opening of the inner tube at the base of the spermatheca into the spermatheeal duct thereby reaching the vaginal portion of the bursa. Thus, the outer and inner tubes at the base of the spermatheca appear to act in the Bruchids respectively as afferent and efferent ducts for the ingress and egress of sperms.

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*The presence of Cup-shaped structures at the distal ends of the bursa in *Bruchus minutissimus* Motsch., *B. pisorum* L., & *B. affinis* Frol., goes against such a hypothesis.

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ON SPAWNING CONDITIONS AND LARVICIDAL PROPENSITIES OF *CARASSIUS AURATUS**

IN Japan gold fishes are naturally distributed even in the smallest streams and are used as food.[1] They have got themselves naturalised in North American waters where they are known to grow to a size of two feet[2,3]; whereas in India they thrive only in garden pools and cisterns where they are cultured as ornamental fishes. They attain a maximum size of eight inches in length.

Although Khan[4] has studied the spawning of this fish from the Punjab, the conditions under which it breeds have not been ascertained. An attempt was made by us to study the conditions under which the fish thrives and breeds in three different places with varying meteorological conditions in South India; and the results are briefly stated below:

Physico-chemical conditions	Madras	Mangalore	Anantharajupettah
Date ..	14-12-1948	27-11-1948	5-2-1949
Turbidity in cm. ..	>30·0	>30·0	>30·0
Temperature in °C. ..	24·4	29·3	27·8
pH value ..	7·2	7·0	8·35
Dissolved O_2 (mg./litre)	4·6	5·2	3·5
Free CO_2 (p.p. 100,000)	0·954	0·347	nil
Bicarbonates (p.p. 100,000)	18·610	5·185	49·833
Chlorides as chlorine (p.p. 100,000)	10·4	4·2	14·0
Silicates as SiO_2 (p.p. 100,000)	1·4	present	2·301
Phosphates as P (p.p. 100,000)	0·004	present	0·1083
Nitrates as N (p.p. 100,000)	nil	nil	nil

The fish spawns throughout the year with maxima from May to August and from November to January. In Mangalore, South Kanara District (lat. 12° 52′ N. and long. 74° 50′ E.), where the climate is humid with an average rainfall of 130 inches per year and the atmospheric temperature ranges from 68 to 98° F., the fish has been observed to breed prolificly in garden ponds. It was found to spawn in cement cisterns in Anantharajupettah, Cudappah District (lat. 14° 20′ N. and long. 79° 5′ E.) which is one of the most arid parts of the Madras Province situated in the interior. The annual rainfall varies from 20 to 30 inches. The temperature rises to 100° F. in summer and falls to 55° F. in winter. In Madras (lat. 12° 5′ N. and long. 80° 20′ F.) where the mean temperature is between 75 and 88° F., the fish has been observed to breed in aquarium jars containing the City Corporation tap water. In all these places

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