TABLE I
Glucose and glycogen contents in the accessory reproductive glands of Chrysocoris purpureus

Chemical substance	Number of specimens	Before mating	After mating
		μgm/gland	
Glucose	17	1·294	1·882
Glycogen	17	1·464	0·941

It is observed that the glucose content of the gland just after mating had increased by about 50% of what was present before mating. On the other hand, the glycogen content of the gland after mating had decreased by one-third of what was present before mating. The glucose and glycogen contents were found almost equal in their quantities before mating, but just after mating the glucose level had become double the quantity of glycogen.

It is generally known that in insects, as in other animals, glycogen is the principal storage polysaccharide[6]. High amounts of glucose, fructose and trehalose as well as fructolysis in the semen have been reported for honey-bee drones[7]. The secretory product of the male accessory glands in insects is used for the formation of spermatophore and seminal plasm and it is known to be lipo- or muco-protein compound[1]. The glycogen of the accessory gland of *Plebeiogryllus guttiventris* is converted into glucose and during this conversion the energy which is released is utilised for the transference of sperms to the female genital tract[3]. It was observed in the present study that after mating the glycogen content of the accessory gland was considerably reduced while glucose increased in its content greatly. This suggests that glycogen is converted into glucose during mating as reported for *P. guttiventris*[3] and the energy released after this conversion is probably utilised for the transfer of sperms during mating[8].

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ON THE FIRST VERTEBRA OF *PUNTIUS SARANA SUBNASUTUS* (VALENCIENNES)

IN the Teleostei, the centra of the vertebrae are invariably biconcave although in the eels they may be flat or even convex in front[1]. Exceptions to this generalisation have been reported in the case of a few fishes. For example, the first vertebra is opisthocoelous in *Wallago attu* (Bloch and Schneider)[2] and *Pisoodonophis boro* (Hamilton)[3], the classical example of this condition in fishes being the ganoid, *Lepidosteus* which has a unique vertebral column composed of opisthocoelous vertebrae[4]. During osteological studies on *Puntius sarana subnasutus* (Valenciennes), it was noticed that in this species also the first vertebra is opisthocoelous. Since this condition is reported as extremely rare, the details are presented here.

The anterolateral and posterolateral views of the first vertebra of *P. s. subnasutus* are shown in Fig. 1, *a* and *b* respectively. The opisthocoelous centrum is much reduced and cup-shaped with no other vertebral processes except a pair of parapophyses (PP) ventrally. The first element of the webarian apparatus—the scaphium—is present, one on each side dorsally (not shown in the figure). The anterior convexity of the centrum is well formed (CX) fitting snugly into the concave posterior side of the basioccipital and maintained in position with the aid of strong ligaments as reported in *P. boro*[3]. The posterior face of the centrum is a deep concavity, making it a typical opisthocoelous vertebra. The scaphium replaces the conventional neural arches of the first centrum and fills in the space between the exoccipital and neural arch of the second vertebra. The posterior side of each scaphium fits into the narrow lateral groove on the centrum (GR). The scaphium is saucer-shaped and communicates anteriorly with the inner ear. On the ventrolateral sides of the centrum, project the stout parapophyses pointing in a lateral direction. The anterior four vertebrae bear no ribs and are modified in conformity with the development of the weberian apparatus characterising the order Cypriniformes.

As in *P. boro*, the opisthocoelous nature of the first vertebra in *P. s. subnasutus* seems to be a constant feature irrespective of age and sex. *P. s. subnasutus* thus joins the small list of fishes with opisthocoelous first vertebra, with *P. boro* and *W. attu* as the first two members.

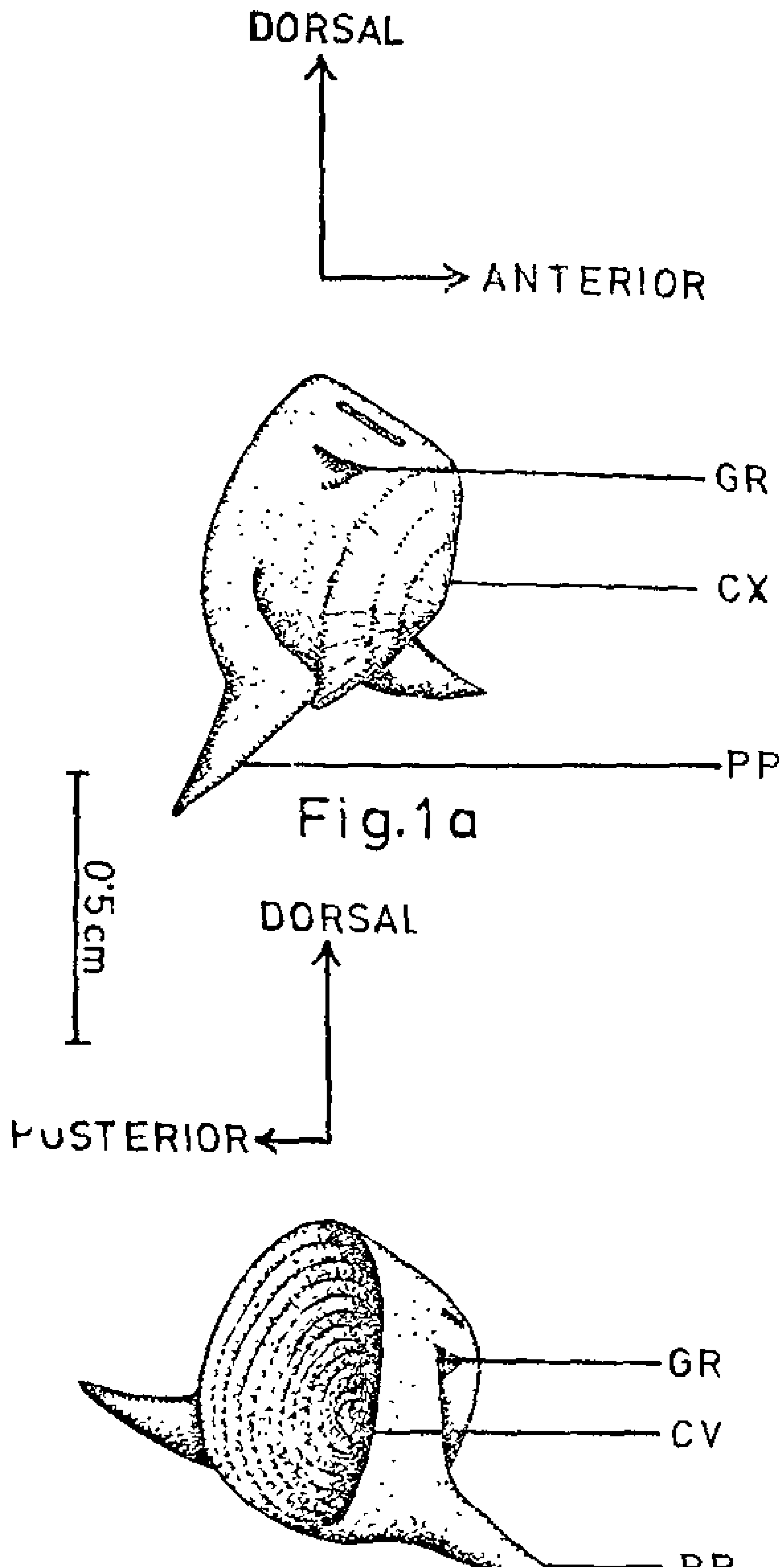

Fig. 1b

FIG. 1. *Puntius sarana subnasutus*, first vertebra.
(*a*) antero-lateral view.
(*b*) postero-lateral view.

CX, convexity; CV, concavity; GR, groove for articulation of scaphium; pp, parapophysis.

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ON A NEW FUNCTION OF CROP IN THE FEMALE CALLIPHORID FLIES (DIPTERA, INSECTA)

THE insect crop has been a subject of many speculations in view of the extreme variation in its anatomy. Several functions have been assigned to this organ but with little justification[1-3]. In the course of some studies on the morphophysiological aspects of respiration in selected calliphorid flies (*Sarcophaga, Lucillia, Chrysomia,* etc.), it was noticed that the crop undergoes remarkable changes. In addition to its customary function as a food reservior, it has been ascertained to subserve an important accessory function. The crop shows dramatic changes during the adult life of the female insect in which it supplies tracheae to the reproductive system and functions as an "air-sac". A modification in which a non-respiratory organ switches over to such a new function has been reported for the first time and confirms the plasticity of the tracheoblast cells during morphogenesis as reported earlier[3-4]. Following are the salient observations:

(1) In the case of newly emerged flies the food reservoir is smoky white, shrivelled and is hardly noticeable. (2) Immediately after the females become gravid the food reservoir gets conspicuously filled with nutritive fluid of translucent yellow colour as can be easily noticed below the abdominal air-sacs. (3) The intermediate stage of gravid females shows further remarkable changes. The left lobe is still yellowish, transparent, and filled up with nutritive fluid, but the right one is smoky white, less conspicuous, not so turgid and filled up with air-bubbles. (4) In the later stages of gravid females ready for parturition, the food reservoir is foggy, filled up with air and mimic "air-sacs", which can be easily seen below the digestive system. Extensive tracheal connections between this air-sac-like actor and developing ovaries were noticed throughout the adult life of the female (Fig. 1).

It is interesting to analyse these observations in terms of the functional needs subserved by this organ. It is to be appreciated here that this "shift" starts as the abdominal air-sacs reduce in size