Table 2. Effect of gonadal steroids on thyroid activity in methallibure-treated *H.fossilis*

Batch*	Sex	Treatment/fish (3 injections a week for 3 weeks)	Maximum thyroidal ^{131}I uptake in % (mean ± SEM)	CR
7	Female	TP 100 µg/injection	14.65 ± 0.88	22.35 ± 1.40 ($p < 0.01$)
8	Female	EB 100µg/injection	16.84 ± 1.20	23.76 ± 1.36 ($p < 0.01$)
9	Female	TSH 10 µg/injection	15.88 ± 1.47	22.00 ± 1.08 ($p < 0.01$)
10	Female	0.6% saline injection	3.45 ± 0.22	7.98 ± 0.66
11	Male	TP 100 µg/injection	2.67 ± 0.32	8.00 ± 0.45 (NS)
12	Male	EB 100 µg/injection	3.98 ± 0.24	8.30 ± 0.52 (NS)
13	Male	TSH 10 µg/injection	8.56 ± 1.60	13.70 ± 1.35 ($p < 0.05$)
14	Male	0.6% saline injection	2.55 ± 0.18	7.00 ± 0.20

*Each batch had 6 specimens; p-values in 7-9 batches are against batch 10 and in 11-13 are against batch 14.

ment, as evaluated by histological parameter, has been recorded in Poecilia[17]. This chemical compound is equally potent in controlling thyroid function and controlling gonadal function[15,16]. Administration of TP and EB in methallibure-treated female fish enhanced thyroid activity almost to the level of controls. Increase in thyroid activity in response to sex steroids in *H.fossilis* is similar to those reported by Matty[10] in *Sparisema* and Singh[11,17] in *Mystus*. Matty[10] observed many folds of increase of thyroid epithelium as a result of direct action of androgen upon thyroid. In intact as well as in hypophysectomized *Mystus*, Singh[11-13] has noticed elevated thyroid ^{131}I-uptake after androgen, estrogen and cortisone injections. Histological or only ^{131}I-uptake techniques are not absolutely safe for the estimation of thyroid function. The findings of these workers are either based on histological[10,17] or ^{131}I-uptake[11-13] methods; therefore their conclusions are questionable. Total thyroidal ^{131}I-uptake, PB^{131}I and CR used together are more dependable and consistent methods for estimation of thyroid activity. Failure of both TP and EB in promoting thyroid activity in methallibure-treated males is not clear. This observation is identical to that recorded in castrated *Mystus*[12]. Singh[12] has noticed that steroid therapy was ineffective if hypophysectomized specimens of *Mystus* were castrated also prior to steroid therapy. Conditions under which castration or methallibure-treatment in male fish prevents restoration of thyroid activity after sex steroid injections, are being investigated. Further data on the pathway of action of this drug over thyroid are being processed and the result will be reported elsewhere. Apparently methallibure prevents TSH secretion as well as thyroid hormone synthesis.

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Optic lobe neurosecretory cells of an Indian spider *Cryptophora* sp. (Areinidae)

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Summary. In all the 3 pairs of optic lobes of *Cryptophora* sp. there are small groups of monopolar PF^- neurosecretory cells which take on a green colour by PF technique and red by Azan. Their function is unknown, but they may be involved with photoperiodically controlled activity rhythms.

The problem of neurosecretion among arachnids, and especially spiders, has not gained much importance as yet. Sasira Babu[2] was the first to give a complete picture of PF neurosecretory cells in the central nervous system of an American spider *Argiope*. Prasad and Kulshreshthra[2] gave the first description of neurosecretory cells in the central nervous system of an Indian spider *Pholcus kapuri* Tikader. While the PF neurosecretory cells found in the nervous system have been described in almost all invertebrate groups, not much is known about PF^- neurosecretory cells. Such neurosecretory cells were known to occur in the optic stalks of crustaceans, but Ganguly[3] described them in the

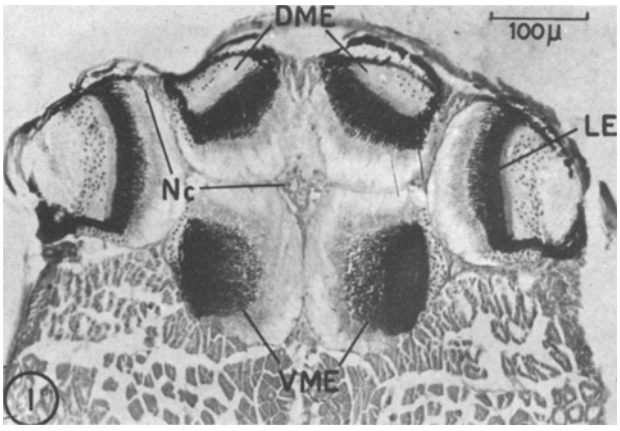
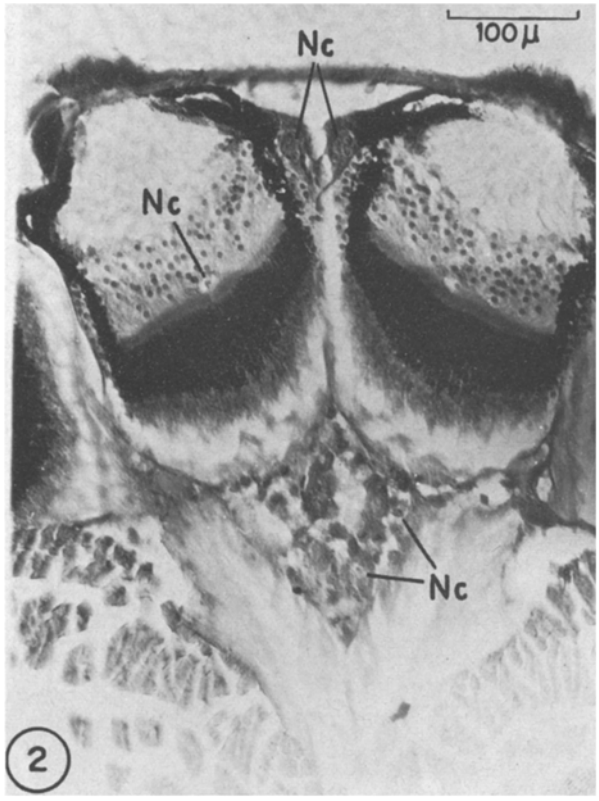


Fig. 1. Frontal section of the anterior region of the body of *Cryptophora* sp. showing the position of eyes and the neurosecretory cells in various locations. NC: Neurosecretory cells, DME: dorsal median eye, VME: ventral median eye, LE: lateral eye.



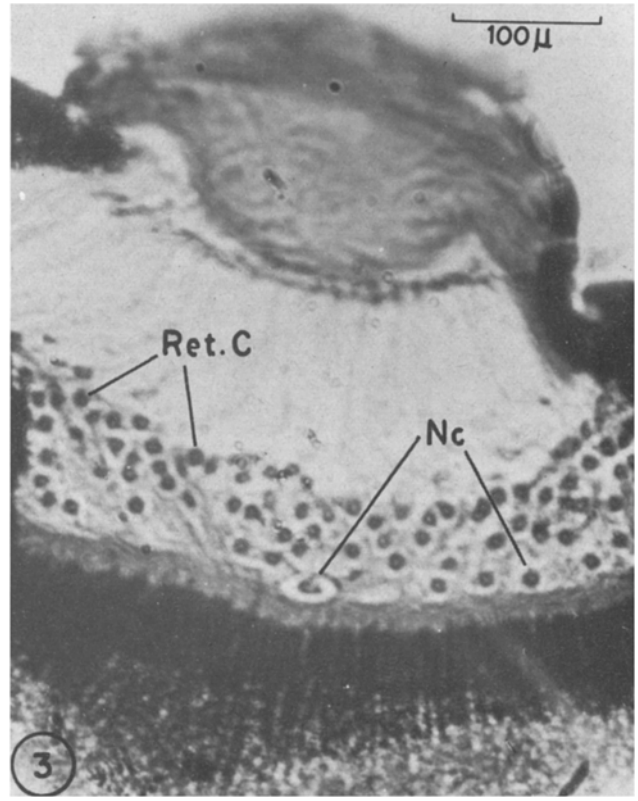


Fig. 2. Frontal section of the eye of spider *Cryptophora* sp. showing neurosecretory cells at the base of the retinal cells above the rhabdites.

Fig. 3. Frontal section of the anterior region of the body of *Cryptophora* sp. showing neurosecretory cells along the middle line surrounded by the 3 pairs of eyes. Ret. C: Retinal cells.

insects for the first time. Subsequently Beattie[4] and Srivastava and Prasad[5] also described them in *Periplaneta* and *Poekilocerus,* respectively. There has been no previous report of neurosecretory cells in the optic lobes of spiders, which is in contrast with the situation in crustaceans and insects.

There are 3 small groups of PF^- monopolar neurosecretory cells in each of the 3 pairs of eyes. There is a group of 7 or 8 cells on the anterior side and a smaller group of 5 or 6 cells on the posterior side of each eye (figure 2). Besides these there are 7 or 8 cells arranged in the form of a plate-like structure at the base of the retinal cells above the rhabdites (figure 3). There is a big group of about 28 neurosecretory cells also present along the middle line surrounded by the 3 pairs of eyes (figure 1). The neurosecretory cells situated at the base of the retinal cells are the biggest and measure about 0.052 mm in length and about 0.026 mm in width, with the nucleus measuring about 0.013 mm in diameter.

The optic lobe neurosecretory cells of *Cryptophora* do not stain blue with PF but remain acidophilic after permanganate oxidation and react with the light-green component of the counterstain. With the Azan technique, the neurosecretory material is stained red. Evidences of a synchronous secretory cycle are present in these neurosecretory cells. Ganguly's[3] contention that these cells may be of phylogenetic significance appears to be logical as the 3 groups, crustacea, insecta and arachnids, are in direct evolutionary

line and the presence of these cells in all the 3 groups has some evolutionary bearing.

These acidophilic cells in the optic lobes of the spider *Cryptophora* sp. constitute a new group of cells in spiders. At the moment, their function can only be speculated upon, but from their location it would appear that they may be somehow connected with the eyes and respond to changes in the light intensity or photoperiod.

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PRO EXPERIMENTIS

Relevance of specific activity in experimental erythrocytocide by ^{55}Fe[1]

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Summary. Iron loads between 0.20 µg and 26 µg, added to 5 µCi ^{59}Fe, were followed for up to 150 days in mice. Relative organ uptake increased as a function of iron load in liver and kidneys while it decreased in bone marrow and blood. Several weeks after injection, all load-related differences disappeared.

The limited range of Auger electrons emitted by ^{55}Fe allows 94% of their energy to be absorbed[2] within a tissue sphere of 300 µm^3. Since X-rays contribute very little irradiation to adjacent tissue ^{55}Fe is a useful cytocidal agent[3,4]. Red blood cell formation, temporarily abolished by ^{55}Fe, recovers speedily due to increased manufacture of pronormoblasts[5]. The isotope has a 2.7 year half-life and eventually causes bone marrow aplasia, leukemia and osteosarcoma[6,7]. Our observations were made in mice after single i.v. injections of $^{55}FeCl_3$ of high specific activity ($\geqslant 1$ mCi/µg Fe). This ^{55}Fe was cyclotron produced to order and very costly. Reactor-produced ^{55}Fe contains only 10–40 µCi/µg Fe. Cyclotron produced ^{55}Fe will be designated as 'carrier-free' in commercial catalogues since no carrier iron is added deliberately. In view of the variable iron content of commercial ^{55}Fe it appears worthwhile to discuss the relevance of specific activity for experimental ^{55}Fe cytocide. Bone marrow radioiron uptake depends not only on the

^{59}Fe retention in percent of injected dose

Tissue	µg Fe	Day 1 x̄ SE	Day 2 x̄ SE	Day 24 x̄ SE	Day 63 x̄ SE	Day 150 x̄ SE
Blood*	0.2	39.5 ± 12.3 (3)	42.7 ± 10.6 (5)	51.8 ± 3.2 (3)	23.6 ± 1.8 (5)	9.2 ± - (1)
	1	46.4 ± 7.8 (3)	53.9 ± 8.4 (5)	41.5 ± 7.8 (3)	20.4 ± 2.2 (5)	11.9 ± - (2)
	3	40.3 ± 4.9 (3)	38.1 ± 10.4 (5)	46.3 ± - (2)	20.7 ± 1.2 (5)	11.0 ± 2.9 (4)
	5	34.1 ± 14.0 (3)	36.7 ± 9.9 (5)	43.3 ± 4.9 (3)	22.8 ± 1.5 (4)	13.3 ± 1.5 (4)
	10	23.6 ± 6.2 (4)	19.7 ± 6.6 (4)	38.7 ± 2.7 (3)	22.5 ± 1.3 (5)	9.7 ± 0.9 (3)
Liver	0.2	10.3 ± 1.9 (3)	11.9 ± 1.9 (5)	9.3 ± 0.6 (3)	9.4 ± 0.6 (5)	7.0 ± - (1)
	1	16.4 ± 2.1 (3)	11.6 ± 0.6 (5)	11.2 ± 3.3 (3)	9.4 ± 6.9 (5)	6.5 ± - (2)
	3	15.0 ± 3.1 (3)	19.9 ± 3.8 (5)	11.4 ± - (2)	10.9 ± 1.1 (5)	5.7 ± 0.5 (4)
	5	23.2 ± 3.7 (3)	21.8 ± 4.3 (4)	14.5 ± 1.6 (3)	12.1 ± 0.9 (4)	6.9 ± 0.4 (4)
	10	26.2 ± 6.3 (3)	32.5 ± 2.6 (4)	19.4 ± 1.9 (3)	12.9 ± 1.5 (5)	5.2 ± 0.3 (3)
Kidneys	0.2	1.6 ± 0.08	2.4 ± 0.46	1.3 ± 0.10	0.64 ± 0.04	0.44 ± -
	1	1.3 ± 0.18	1.4 ± 0.08	1.4 ± 0.74	0.74 ± 0.08	0.39 ± -
	3	2.4 ± 0.47	3.3 ± 0.69	1.4 ± -	0.85 ± 0.08	0.52 ± 0.04
	5	2.9 ± 0.89	2.4 ± 0.82	1.5 ± 0.15	0.97 ± 0.09	0.44 ± 0.03
	10	2.1 ± 0.51	3.0 ± 0.49	1.5 ± 0.25	0.81 ± 0.04	0.46 ± 0.09
Hind leg**	0.2	1.33 ± 0.17	0.74 ± 0.09	0.29 ± 0.03	0.30 ± 0.03	0.17 ± -
	1	0.84 ± 0.17	0.55 ± 0.03	0.29 ± 0.03	0.27 ± 0.02	0.14 ± -
	3	1.01 ± 0.28	0.55 ± 0.04	0.45 ± -	0.33 ± 0.03	0.20 ± 0.04
	5	0.94 ± 0.09	0.66 ± 0.13	0.53 ± 0.12	0.50 ± 0.02	0.14 ± 0.01
	10	0.83 ± 0.16	0.65 ± 0.05	0.47 ± 0.04	0.31 ± 0.03	0.13 ± 0.02
Heart	0.2	0.14 ± 0.01	0.27 ± 0.06	0.18 ± 0.01	0.18 ± 0.02	0.15 ± -
	1	0.12 ± 0.02	0.14 ± 0.01	0.15 ± 0.03	0.24 ± 0.04	0.15 ± -
3	3	0.17 ± 0.05	0.23 ± 0.05	0.22 ± -	0.34 ± 0.04	0.18 ± 0.02
	5	0.23 ± 0.06	0.22 ± 0.04	0.24 ± 0.03	0.28 ± 0.02	0.23 ± 0.04
	10	0.17 ± 0.03	0.24 ± 0.02	0.22 ± 0.02	0.28 ± 0.02	0.17 ± 0.00

*Total blood volume assumed to be 5% of b.wt.[18]. **Femur, tibia and fibula cleaned free of muscle. This constitutes about 5% of the bone marrow[8]. Fe uptake and retention in mice injected with 5 µCi and 0.2, 1, 3, 5, or 10 µg total iron. The second of 2 experiments is shown. Samples of 200 µl blood were obtained from ether-anesthetized mice prior to perfusion with physiological saline and organ removal, and whole blood values were computed assuming a blood volume of 5% b.wt. No spleens were taken because of their resistance to complete perfusion. Radioactivity of whole organs was counted in a well type scintillation counter. Number of mice used is indicated in parenthesis.