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Some Abnormal Conditions of the Reproductive System of the Saltwater Crayfish, *Jasus lalandii* (Milne Edwards)

By

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PLATES VI AND VII

During the examination of a large number of crayfish, *Jasus lalandii* (Milne Edwards), caught off the south-east coast of Tasmania, several specimens exhibiting abnormal conditions of the reproductive system were observed. These are recorded and briefly described hereunder.

A PSEUDO-HERMAPHRODITE

Instances of hermaphroditism in Decapodan Crustacea have been discussed in some detail by W. P. Hay (1905) and S. Runnström (1925). A case of pseudo-hermaphroditism in a specimen of *Jasus lalandii* taken in South African waters was described by C. von Bonde in 1937. Externally the crayfish exhibited female characters on the left side and male characters on the right side, but internally only female features were evident.

The specimen described in the present paper was caught at Wedge Bay, Tasman Peninsula, by Mr. G. L. Spaulding on 15th June, 1937. It was of moderate size, having a total length of 293 mm., a carapace length of 113 mm., and a weight of 744 grammes. In most of its external features it resembled a male. The cephalothorax and abdomen had the same form as in a male and the fifth pair of pereiopods ended in a simple non-chelate claw. The specimen was remarkable, however, in having no genital apertures. The coxopodites of both the third and the fifth pairs of pereiopods showed no signs of any gonopore ever having developed (Pl. VII, fig. 5).

The abdominal appendages or pleopods exhibited an interesting combination of male and female characters. The exopodites of the appendages on the second, third, fourth, and fifth abdominal segments were small and leaf-like, resembling those of a normal male. The endopodites, however, instead of being absent as in a male, were present and resembled those of a female, but were on a much smaller scale. Thus the endopodites of the pleopods on the second abdominal segment were small and leaf-like, while those on the pleopods of the third, fourth, and fifth abdominal segments were rod-like and provided with long setae (Pl. VI, figs 1 and 2).

Dissection showed that the internal organs, excepting those of the reproductive system, were normal. The gonads, however, had the appearance of enlarged testes. On the right side of the body a vas deferens arose from the gonad in the usual position and, after forming an irregular coil, ended blindly without extending down to the coxopodite of the fifth pereiopod. On the left side of the body no genital duct was present (Pl. VI, fig. 3).

Serial sections cut longitudinally through a small portion of the gonad revealed the presence of both ova and spermatozoa (Pl. VI, fig. 4).

The crayfish was therefore very different from the South African pseudohermaphrodite, which, according to von Bonde (1937, p. 830), had a gonad, which showed the typical ovarian structure of the female.

Female with only one Genital Aperture

A female crayfish caught at Wedge Bay on 10th July, 1937, was found to have only a single genital aperture. This was situated in the normal position on the coxopodite of the third pereiopod of the right side. There was no genital aperture on the corresponding coxopodite of the left side (Pl. VII, fig. 6).

The specimen was 'in berry' and had a total length of 284 mm., a carapace-length of 109 mm., and a weight of 701 grammes. The eggs, after removal from the pleopods, weighed 63·9 grammes, the total number of eggs carried being about 281,000.

On dissection the ovary was found to be normal in shape and size, but the oviduct of the left side ended blindly in a small bulbus expansion in the coxopodite of the third pereiopod.

The absence of a genital aperture on the left side must have made the process of egg-laying somewhat difficult. It was obvious, however, from the large number of eggs carried and the collapsed condition of the gonad, that eggs formed in the left ovary had passed across the transverse bridge to the right ovary in order to reach the exterior by way of the single genital opening on the right side. Only a few eggs had remained unlaid in the ovary on the left side. These were undergoing absorption and were collected in a bend of the gonad near its junction with the blind oviduct.

Von Bonde (1937, p. 829) records a South African specimen 'having only a single genital aperture situated on the coxopodite of the pereiopod of the left side . . . . The left ovary was normally developed and was connected by an oviduct to the genital aperture. The right ovary, however, had a twisted appearance and was somewhat smaller than the left one. Also there was no oviduct on the right side'.

A Female with an extra Genital Aperture

Instances of Decapoda having abnormal genital apertures have been described by Bateson (1894), Marshall (1902), and Ridewood (1909).

The specimen described in the present paper was a female caught at Wedge Bay, 21st July, 1940. The crayfish was 'in berry'. It had a total length of 254 mm., a carapace-length of 93 mm., and a weight of 460 grammes. The total weight of eggs carried on the pleopods was 47·5 grammes.

The additional genital aperture was situated on the coxopodite of the fourth pereiopod of the left side (Pl. VII, fig. 7). On dissection, the ovary was found to be quite normal. A pair of oviducts led to the genital apertures on the coxopodites of the third pereiopods. There was no duct leading to the accessory aperture, which was closed.

Females with Abnormal Ovaries

In a normal female the reproductive system consists of paired ovaries, one on each side, extending from the region of the stomach to the first abdominal segment. The two ovaries are connected by a transverse bridge which crosses over the gut a short distance behind the stomach and is anterior to the oviducts.

A female caught at Wedge Bay on 6th February, 1939, exhibited an unusual condition of the ovaries. Externally the specimen was quite normal. It had a total length of 297 mm., a carapace-length of 112 mm., and a weight of 716 grammes. On dissection it was found that the left and right ovaries, in addition to being connected by the normal transverse bridge in front of the oviducts, were also joined together by a distinct fusion a short distance behind the oviducts (Pl. VII, fig. 8). The appearance of the fusion seemed to indicate that the posterior ends of the ovaries had crossed over each other and become intimately united at the intersection.

Another female taken at the same locality on 24th November, 1941, exhibited a similar fusion of right and left ovaries behind the oviducts. In this case, however, the union appeared to have been brought about without a crossing over of the two organs. In other respects the crayfish was quite normal. It had a total length of 264 mm., a carapace-length of 97 mm., and a weight of 532 grammes.

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PLATE VI

Jasus lalandii (Milne Edwards)

FIG. 1.—Left pleopod of second abdominal segment of pseudo-hermaphrodite. *en.* endopodite, *ex.* exopodite.

FIG. 2.—Left pleopod of third abdominal segment of pseudo-hermaphrodite. *en.* endopodite, *ex.* exopodite.

FIG. 3.—Gonads of pseudo-hermaphrodite showing abnormal vas deferens on right side.

FIG. 4.—Section through portion of gonad of pseudo-hermaphrodite. *ov.* developing ova; *sp.* groups of spermatozoa in a mass of secretion; *spc.* spermatocytes.

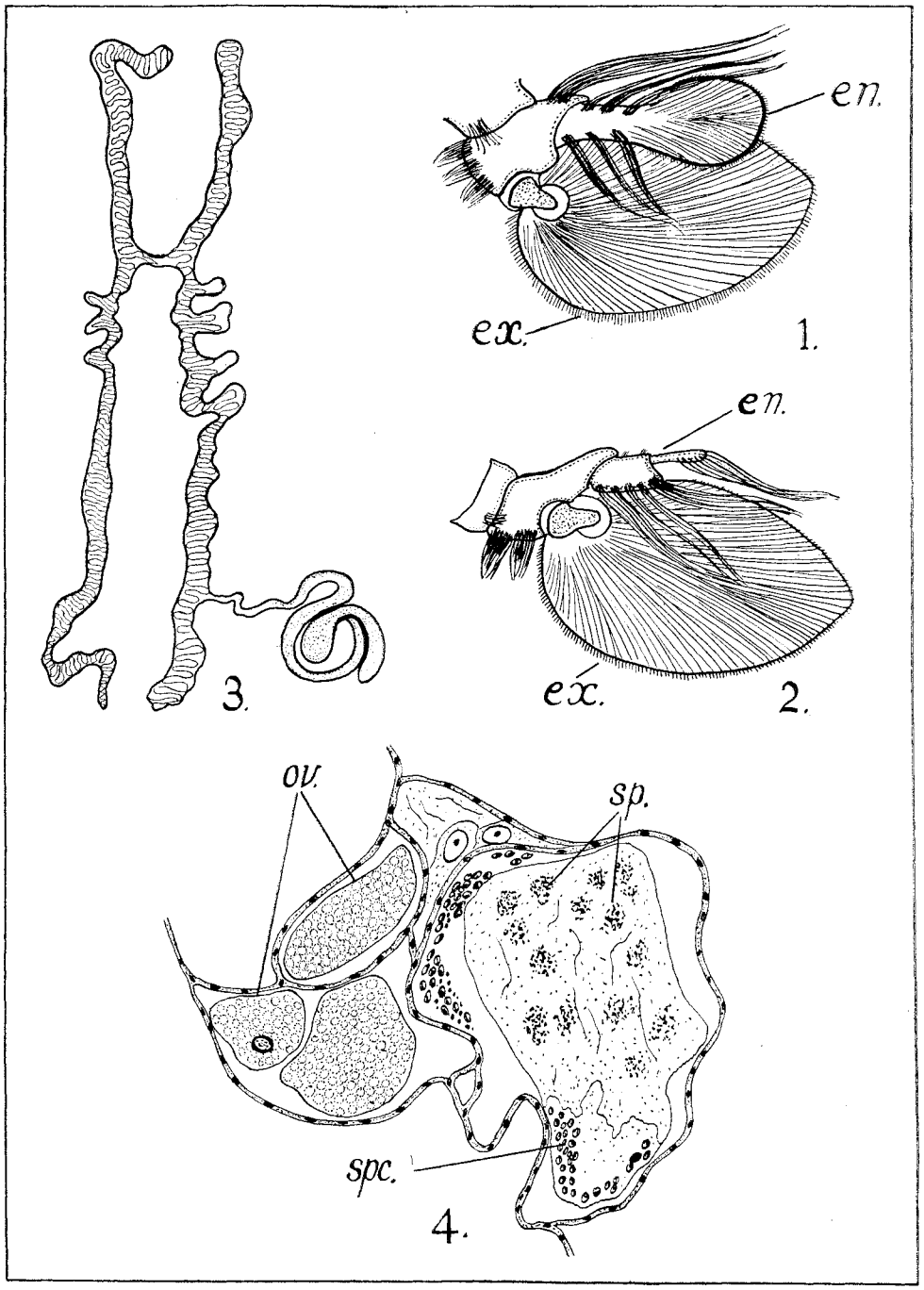
en.
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PLATE VII

Jasus lalandii (Milne Edwards)

FIG. 5.—Sternum and bases of pereiopods of pseudo-hermaphrodite showing absence of genital apertures.

FIG. 6.—Sternum and bases of pereiopods of female having a single genital aperture, which is visible on the third right coxopodite.

FIG. 7.—Sternum and bases of pereiopods of female with an extra genital aperture, which is visible on the fourth left coxopodite.

FIG. 8.—Reproductive organs of female showing an abnormal fusion of right and left ovaries.

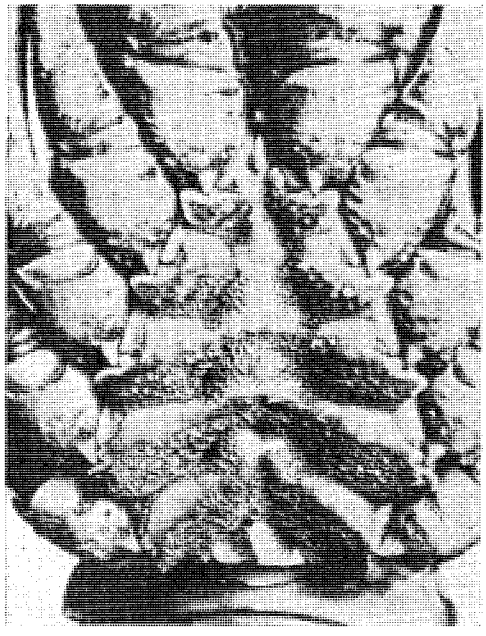

FIG. 5

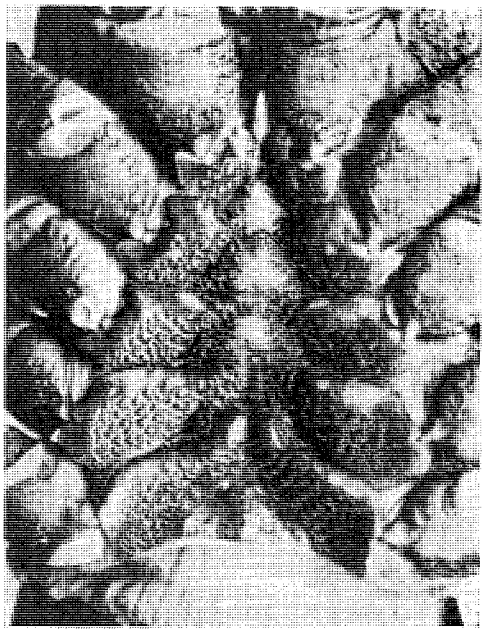

FIG. 6

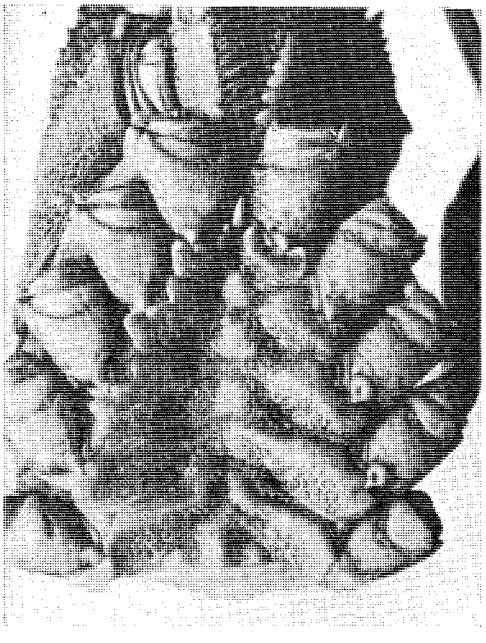

FIG. 7

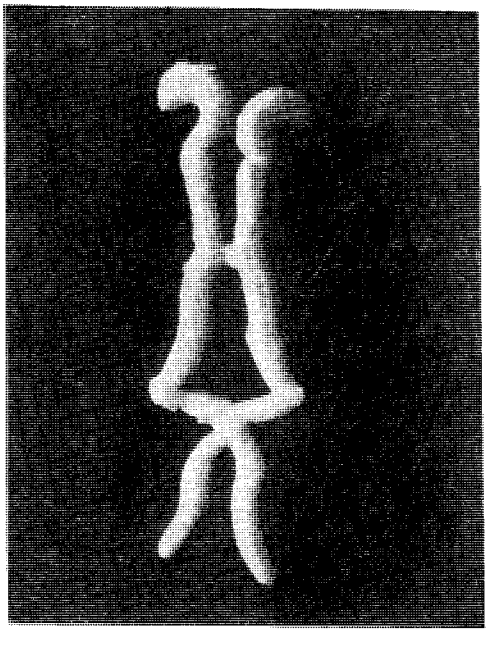

FIG. 8