

SCANNING ELECTRON MICROSCOPICAL OBSERVATION ON ADULT NEOBENEDENIA MELLENI (MONOGENEA, CAPSALIDAE)

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Abstract *Neobenedenia melleni* (MacCallum, 1927) Yamaguti, 1963, a capsalid monogenean parasitising the skin of marine cultured fish, *Seriola dumerili* (Carangidae) was studied by scanning electron microscope (SEM). The body surface of *N. melleni* lacks spines. Both the anterior attachment organs and haptor are disc shaped, the accessory sclerites, anterior hamuli and posterior hamuli are sheathed in tegument. Accessory sclerites possess sharp distal tips. Anterior hamuli and posterior hamuli possess curved tip, and marginal hooklets are arranged radially around haptor.

Key words *Neobenedenia melleni*, SEM, observation.

1 Introduction

Neobenedenia melleni (MacCallum, 1927) Yamaguti, 1963 (Monogenea, Capsalidae), synonymous with *Neobenedenia girellae* (Hargis, 1955) Yamaguti 1963, was first reported in California by Hargis (1955) as *Benedenia girellae*. Yamaguti (1963) placed it into *Neobenedenia*. Whittington and Horton (1996) provided a detailed justification for the synonymous and revised the genus, and *Neobenedenia girellae* turn into a synonymous of *Neobenedenia melleni*. *N. melleni* inhabits the skin, fins, eyes and gills of some cultured marine fishes. Infected fish include the sciaenid *Pseudosciaena crocea*, the carangid *Seriola dumerili* and the serranid *Epinephelus* sp. During the last few years, cultured *Pseudosciaena crocea* (Richardson) from Fujian, China have been severely infected by *Neobenedenia melleni*, which has caused mass mortalities of fish stocks (Yang *et al.*, 2001). Mortalities have also occurred in Guangdong and Hainan Provinces of China (Zhang *et al.*, 1999, 2001). *Pseudosciaena crocea* (Richardson) is a new host record for *Neobenedenia melleni*. Lin (2000) described microvilli on tegument of *Neobenedenia* sp. collected from *Erythepterus* sp. and *Epinephelus tauvina* in Guangdong Province, China. We are very interested in the taxonomy of *Neobenedenia melleni*. Some fine structures could not be observed clearly by optical microscope. At present, there is no previous report of a scanning electron microscope (SEM) study on

adult *Neobenedenia melleni* in China, so we present the information on it in this paper, to facilitate further research on the worm now.

2 Materials and Methods

12 monogeneans were collected alive from the skin of *Seriola dumerili* cultured in a net pen off the coast of Xiamen (24° 30' N, 118° 03' E), Fujian, China, were washed in PBS twice, then fixed in glutaraldehyde (2.5% solution in sodium cacodylate buffer), rinsed in concentration sodium cacodylate buffer, dehydrated in an ethanol series and dried in a Balzers Union Critical Point Dryer. The specimens were sputter-coated with gold in a Balzers Union Sputter Coater Device and scanned using a Hitachi S-520 scanning electron microscope, operating at 15 KV. Measured in millimeter.

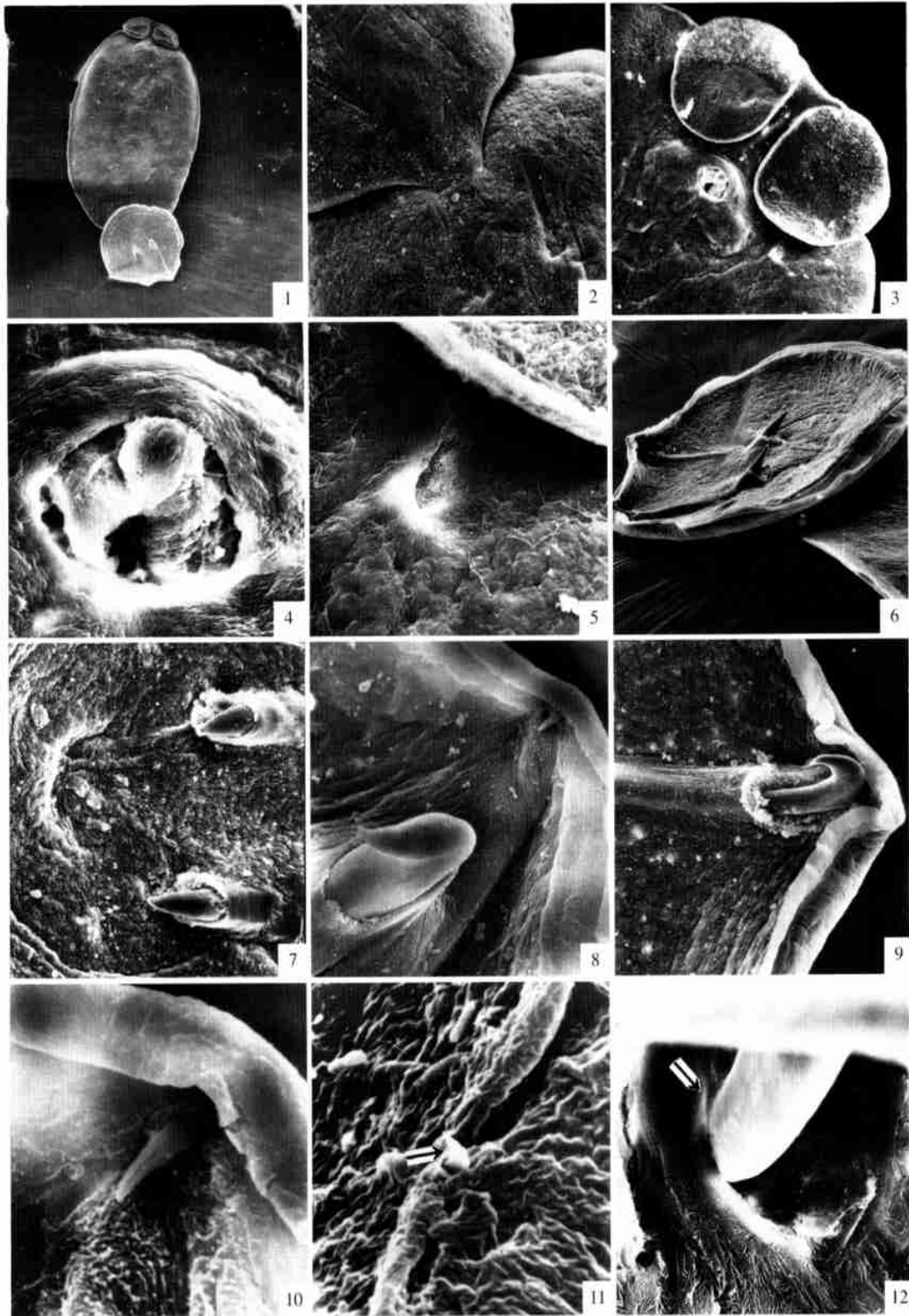
3 Results

Description. *Neobenedenia melleni*, total length including haptor 2.635–4.689 (3.817), maximum breadth 1.255–2.683 (2.015) in size, the body lacks spine and microvilli and the tegument of the worm possesses pits (Figs. 1, 2). Both the anterior attachment organs are disc shape, (0.395–0.426) × (0.312–0.386) (0.413 × 0.358) in size (Fig. 3). The mouth is located immediately posterior to the anterior attachment organs (Fig. 4). The genital pore is located posterior to the sinister anterior attachment organs and the genital organ is not extruded from body (Fig. 5). The haptor is disc shape also and lacks a handle, (0.983–

This work was supported by the Fujian Provincial Natural Science Foundation (B 9910005).

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Received 17 Nov. 2002, accepted 20 Feb. 2003.



Figs 1-12. Scanning electron microscopical observation on adult of *Neobenedenia mellei*. 1. Adult, ventral view, $30\times$. 2. Adult, dorsal view, $200\times$. 3. Anterior attachment organs, ventral view, $200\times$. 4. Mouth, ventral view, $1200\times$. 5. Genital pore, ventral view, $1000\times$. 6. Haptor, ventral view, $120\times$. 7. Accessory sclerites, ventral view, $300\times$. 8. Hamuli, ventral view, $2000\times$. 9. Anterior hamuli, ventral view, $500\times$. 10. Posterior hamuli, ventral view, $7000\times$. 11. Marginal hooklet, ventral view, $7000\times$. 12. Hamuli embedded within the skin of *Sariola dumerili*, $2000\times$.

1.081) × (0.935-1.057) (1.051 × 1.026) in size. It is surrounded by a marginal valve and its inner surface is composed of circular stripes and ridge like protuberances (Fig. 6). Both the accessory sclerites and the anterior hamuli are enclosed in a membranous sheaths. The accessory sclerites possess sharp tips, and stretch obliquely anteriorly (Fig. 7). The proximal ends of the anterior hamuli are embedded in sheath, the distal end of the anterior hamuli are barb-like, with a sharp tip protruding from the sheath and a distance from the posterior hamuli (Fig. 8). The anterior hamuli are smooth, with a sharp recurved point (Fig. 9). The posterior hamuli are straight, with fine curved point, lying within the marginal valve (Fig. 10). Marginal haptor hooklets are arranged radially around the margin of the haptor, 0.008-0.012 (0.010) in length (Fig. 11). Most of the proximal end of posterior hamuli are embedded into the sheath, the distal end of posterior hamuli curved, and insert deeply to the tegument of fishes when attached (Fig. 12).

4 Discussion

Recently, *Neobenedenia melleni* infections among cultured marine fishes have been observed in Fujian, China (Yang *et al.*, 2001). *Seriola dumerili* are infected more than others. Prevalence can reach 100%. Intensity of *Seriola dumerili* also is the highest among infected fishes. This suggests that *Seriola dumerili* may be very susceptible host to *Neobenedenia melleni*.

Lin (2000) described microvilli on tegument of *Neobenedenia* sp. collected from *Erythrepterus* sp. and

Epinophelus tauvina in Guangdong Province, China. The absence of microvilli in *Neobenedenia melleni* suggested that it is a different species.

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玫氏新本尼登虫扫描电镜观察 (单殖吸虫纲, 分室科)

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摘要 报道寄生于福建海水养殖鱼类高体的玫氏新本尼登虫 (单殖吸虫纲, 分室科) 的扫描电镜观察。虫体体表无棘, 前吸器和后吸器盘状。副甲片、前钩和后钩位于鞘内,

关键词 玫氏新本尼登虫, 扫描电镜, 观察。

中图分类号 954.1

副甲片尖状, 前钩和后钩弯钩状, 边缘小钩呈辐射状排列于后吸器边缘。

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