

## Descriptions of Some Luminous Squids from the Water of Northern New Guinea collected by the R/V Tagula

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(With 3 Text-figures and 1 Table)

探検船タグラの捕獲したニューギニアの発光イカについて

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1959年9月から12月にかけて行なわれたカリフォルニア大学の Alpha-Helix 1969 Biological Expedition に参加した際、ポートモレスビーの Department of Agriculture Stock and Fisheries の調査船 Tagula により探検の基地 Madang 附近、北部の Manam 火山附近、Ramu 河河口の大形プラクトンネット、およびトロールによって得た発光イカ6種について発光器の数、位置、発光状態、発光器内容について記載した。採集した材料は6種で第1表に示す通りである。

Nos. 1~3 までは小形 (80 mm) の深海性のイカで、発光器は眼球上、皮膚内、腕足の先端、内臓にあり、発光は神経の直接支配であるから、生時よく発光するが、死後まもなく消光、再び発光を恢復することが困難である。発光の状態は、日本のホタルイカ *Watasenia scintillans* に似ている。

Nos. 4~5 の *Symplectoteuthis* sp. A および B は直腸に密着する2つの真珠様発光器があり、内臓発光器の一種であるが、*Pyroteuthis* sp. にみられるような内臓発光器ではない。*Pyroteuthis* sp. の内臓発光器が、反射器、発光体、レンズ等を具えた発達した発光器であるに反し、*Symplectoteuthis* sp. の内臓発光器はより単純で、イカの死後でも機械的な刺激で発光する。発光物質は化学物質で外的な条件で発光させることができる。この点、スズイカ *Eucleoteuthis luminosa* の発光とに似ている。

*Loligo* sp. は他の多くの開眼族 *Myopsida* の浅海性発光イカに見られるように、墨汁嚢の上に1対の発光器があり、発光体内には発光バクテリアが共生、イカ自身に発光能力はない。

Luminous squids numbering six species were collected with large plankton nets by the R/V Tagula during the Alpha Helix 1969 Biological Expedition to New Guinea.

The first three species were collected by towing large plankton nets at a depth of about 100 meters off Madang harbour and off Manam Volcano at night. They were small in size and appeared to be deep-sea forms. The last three species were collected at a depth of 20-30 meters near the mouth of Ramu River, north coast of New Guinea. They were of moderate size and appeared to be shallow water forms.

All the species were identified through the courtesy of Dr. R. E. Young of the Dept. of Oceanography, University of Hawaii.

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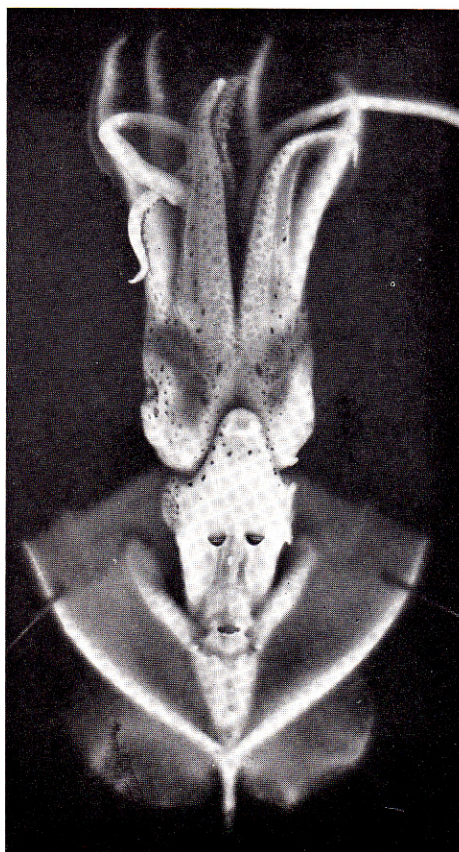
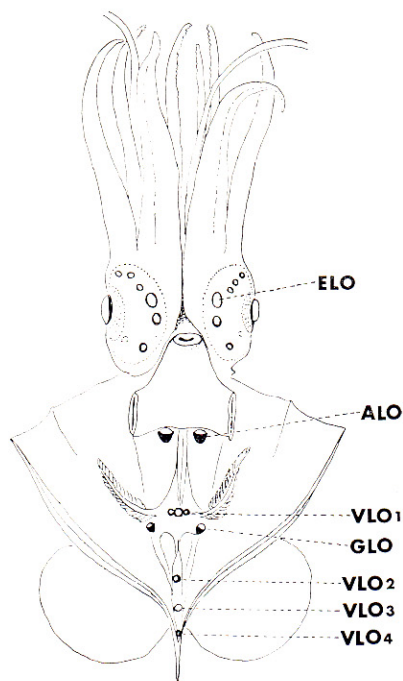
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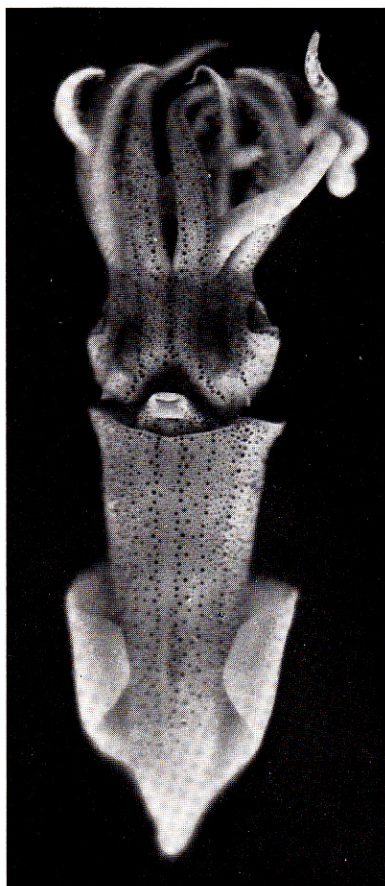
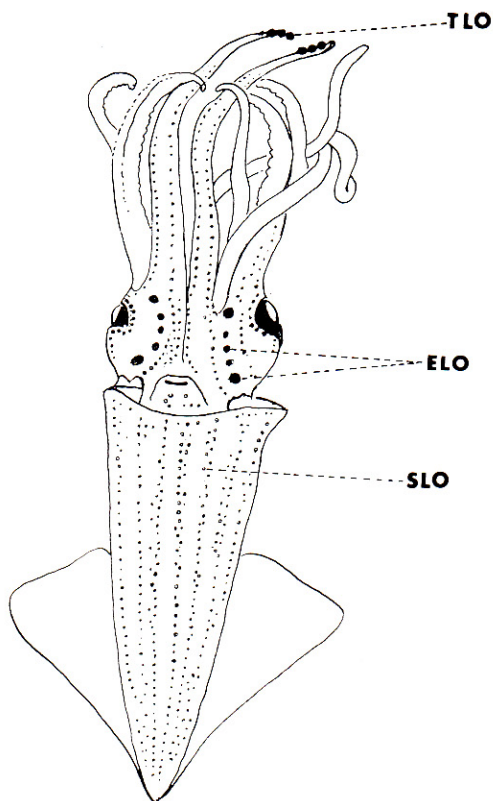
Table 1. Luminous squids collected by R/V Tagula

No.	Name of Squids	Place and date of collection	Remarks (After R.E. YOUNG)
1	Family Enoplateuthidae <i>Pyroteuthis</i> sp.	Off madang, North coast of New Guinea Oct. 20, 1969	Probably an undescribed species of <i>Pyroteuthis</i> . However, the specimen was a female and most of the character of this undescribed species rest with the male.
2	<i>Abraliopsis</i> n.sp.	Off manam Volcano North Coast of New Guinea Oct. 27, 1969	Presently being described by Lourdes Burgess.
3	Family Ctenopterygidae <i>Ctenopteryx</i> sp.	"	There is a complex of species in this genus which have not yet been resolved. All species are frequently lumped under the name <i>C. sicula</i>
4	Family Ommastrephidae <i>Symplectoteuthis</i> sp. A.	"	One of these is a new species the other is <i>S. oualensis</i> . This situation has been known for some years but no one has yet been able to resolve the problem.
5	<i>Symplectoteuthis</i> sp. B.	"	
6	Family Loliginidae <i>Loligo</i> sp.	Off madang, North coast of New Guinea Oct. 21, 1969	Not yet identified.

Fig. 1. A. *Pyroteuthis* sp.Fig. 1. B. *Pyroteuthis* sp.

ELO: Luminous organs on the eye ball  
 ALO: Anal luminous organ  
 GLO: Gill luminous organ  
 VLO: Ventral luminous organs



Fig. 2. A. *Abraliopsis* n. sp.Fig. 2. B. *Abraliopsis* n. sp.

TLO: Tentacle luminous organ

ELO: 5 photophores on a eye ball.

SLO: Skin organ

*Pyroteuthis* sp. belonging to the family Enoploteuthidae possessed five organs over each eyeball, and three paired and four individual organs on the intestine. The light from these organs was clearly visible through the transparent mantle, *Abraliopsis* n. sp. of the same family possessed five luminous organs over each eye ball and three small black organs on the tips of one pair of arms. In addition, numerous single rows of small cutaneous organs were present. These organs arranged symmetrically over the head, 2 pair of arms, and ventral side of the body. *Ctenopteryx* sp. belonging to the Ctenopterygidae possessed three luminous organs over each eyeball and a large luminous organ over the inc sac. *Symplectoteuthis* sp. A belonging to the family Ommastrephidae was slightly smaller (150 mm) in size and when living had a pale yellow mantle, whereas *Symplectoteuthis* sp. B had a reddish mantle. Both possessed two pearl white luminous organs on the rectun. *Loligo* sp. belonging to the family Loliginidae possessed one pair of luminous organs on the inc sac. In these luminous organs live luminous bacteria symbiotically.

Living specimens of the first three species gave off a readily visible light, but luminescence was quickly extinguished on death. The luminescence could not be restored. This behavior resembled very strongly the luminescence of *Watasenia scintillans*. Living *Symplectoteuthis*, however, was not luminous when observed externally, but the luminescence from the two luminous glands was clearly

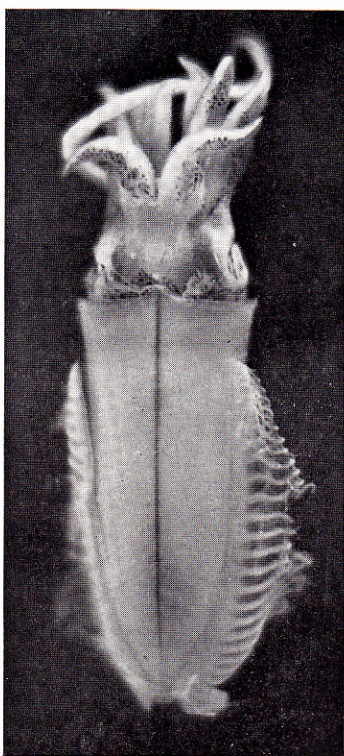
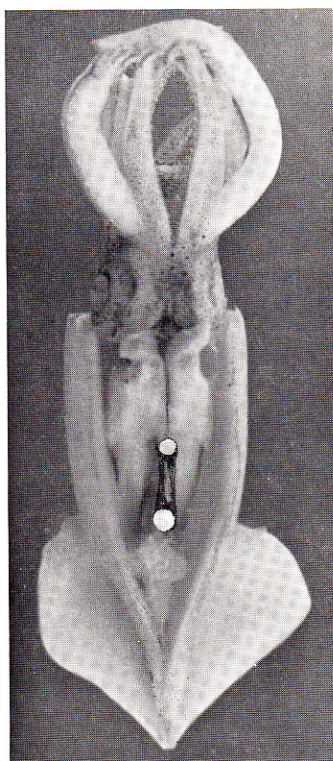
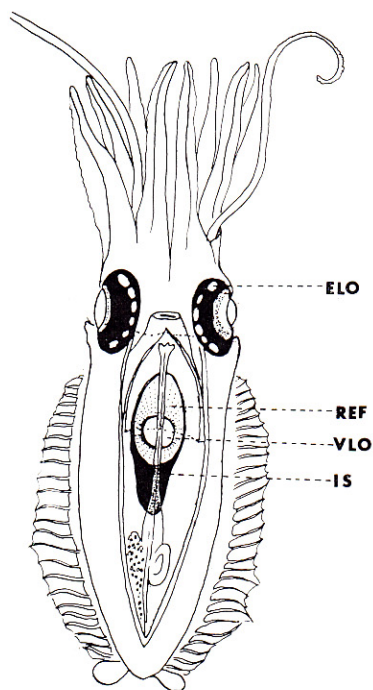
Fig. 3. A. *Ctenopteryx* sp.Fig. 4. A. *Symplectoteuthis* sp. A.

Fig. 3. B. *Ctenopteryx* sp.  
 ELO: eye ball luminous organ  
 IS: Ink Sac  
 Refl: Reflector  
 VLO: Ventral luminous organ

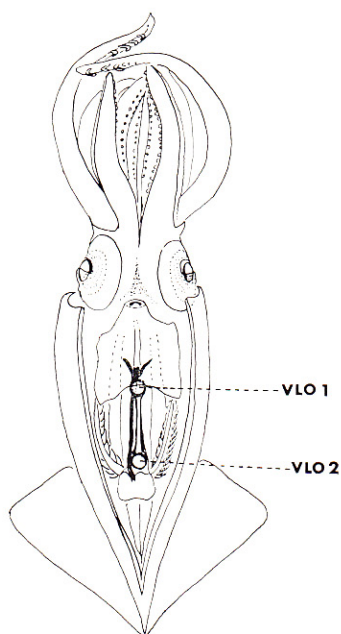


Fig. 4. B. *Symplectoteuthis* sp.  
 VLO<sub>1</sub>, VLO<sub>2</sub>; Ventral luminous organ

visible when the mantle was cut and the glands exposed. The luminescence ability of the glands was preserved by freezing up to live days.

Thawing and rubbing the glands with the fingers caused the luminescence to reappear. The luminescence of *Symplectoteuthis* sp. A. and B. appeared to resemble to that of Suji-ika, *Eucleoteuthis luminosa* belonging to the family Ommastrephidae.