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**Report**


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## ***Caloglossa beccarii* (Ceramiales, Rhodophyta) from Thailand on the Malay Peninsula and its distribution in Southeast Asia**

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### **Abstract**

*Caloglossa beccarii* (Zanardini) De Toni (Ceramiales, Rhodophyta), a species of freshwater red algae, has been found attached to stones submerged in clear waters slightly downstream from the Sirindhorn Waterfall (100 m asl) in Sungai Kolok, Thailand, on the Malay Peninsula. It is characterized by the following features: (i) adventitious branching from lateral pericentral initials; (ii) narrow, elliptical thallus internodes, with the blade moderately constricted at the nodes; (iii) 5.5-8.3 mm long internodes, (4-) 5-7 lateral second- and third-order cell rows produced by each axial cell. This paper discusses the distribution of this species in Southeast Asia.

**Key words:** freshwater red algae, *Caloglossa beccarii*, Malay Peninsula, Thailand, Southeast Asia

### **Introduction**

*Caloglossa beccarii* (Zanardini) De Toni (1900) was originally described as *Delesseria beccarii* Zanardini (1872) from a stream near Gunung Pueh, western Sarawak, Borneo in Malaysia. Post (1936) placed *Caloglossa amboinensis* (Karsten) De Toni (1900) described from Ambon in Indonesia into *C. beccarii*. King and Puttock (1994) also placed *C. ogasawaraensis* var. *latifolia* Kumano (1978) from the freshwater stream, Sungai Cherok, Perak in Malaysia, into the synonym of *C. beccarii*, as it is inseparable on morphological grounds.

According to King and Puttock (1994), *Caloglossa beccarii* occurs epilithic on stones in freshwater coastal streams and epiphytic on mangrove trunks and roots in areas with moderate water flow and high turbidity, and its distribution is restricted to Southeast Asia, the western Pacific and northern Australia.

In the present paper, we report on *Caloglossa beccarii* found in a freshwater stream in Thailand,

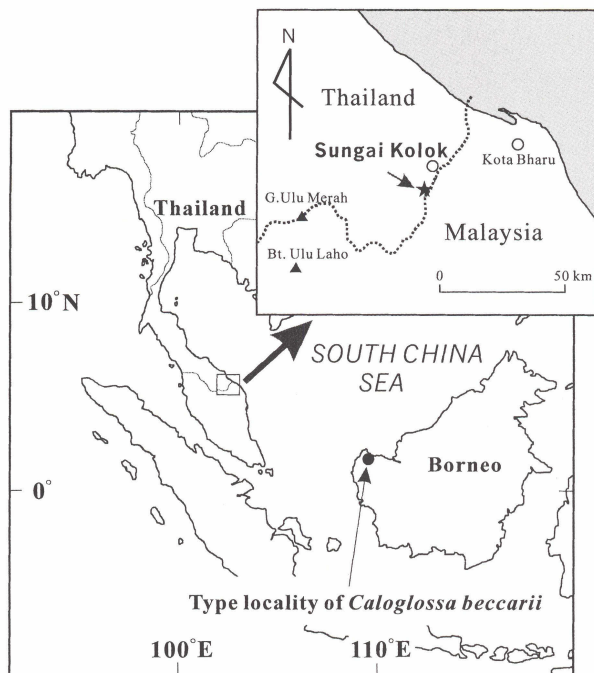
located on the Malay Peninsula, and present some information on its distribution in Southeast Asia.

### **Materials and Methods**

Specimens of *Caloglossa* were found attached to submerged stones at the site slightly downstream from Sirindhorn Waterfall in Sungai Kolok (ca. 6°N, 102°E), Thailand on the Malay Peninsula (Fig. 1), forming a purple mat-like weave (Fig. 2). Specimens were picked up and some of them were dried, while others were preserved with formalin. Both dry and liquid preserved specimens are kept in the Museum of Nature and Human Activities, Hyogo (HYO). Liquid preserved specimens are examined in the present study. Light micrographs were made on an Olympus photomicroscope using Fuji Neopan F rated at 32 ISO.

### **Description of Species**

***Caloglossa beccarii* (Zanardini) De Toni, 1900: 730**



**Fig. 1.** Location of the sampling site. The type locality of *Caloglossa beccarii* in western Sarawak, Malaysia in Borneo, is also shown.

(Figs. 3-8)

**Synonyms:** *Delesseria beccarii* Zanardini (1872: 140, pl. 5A); *Delesseria amboinensis* Karsten (1891: 265, pl. 5), *Caloglossa amboinensis* (Karsten) De Toni (1900: 731), *Caloglossa ogasawaraensis* var. *latifolia* Kumano

(1978: 103, Fig. 5)

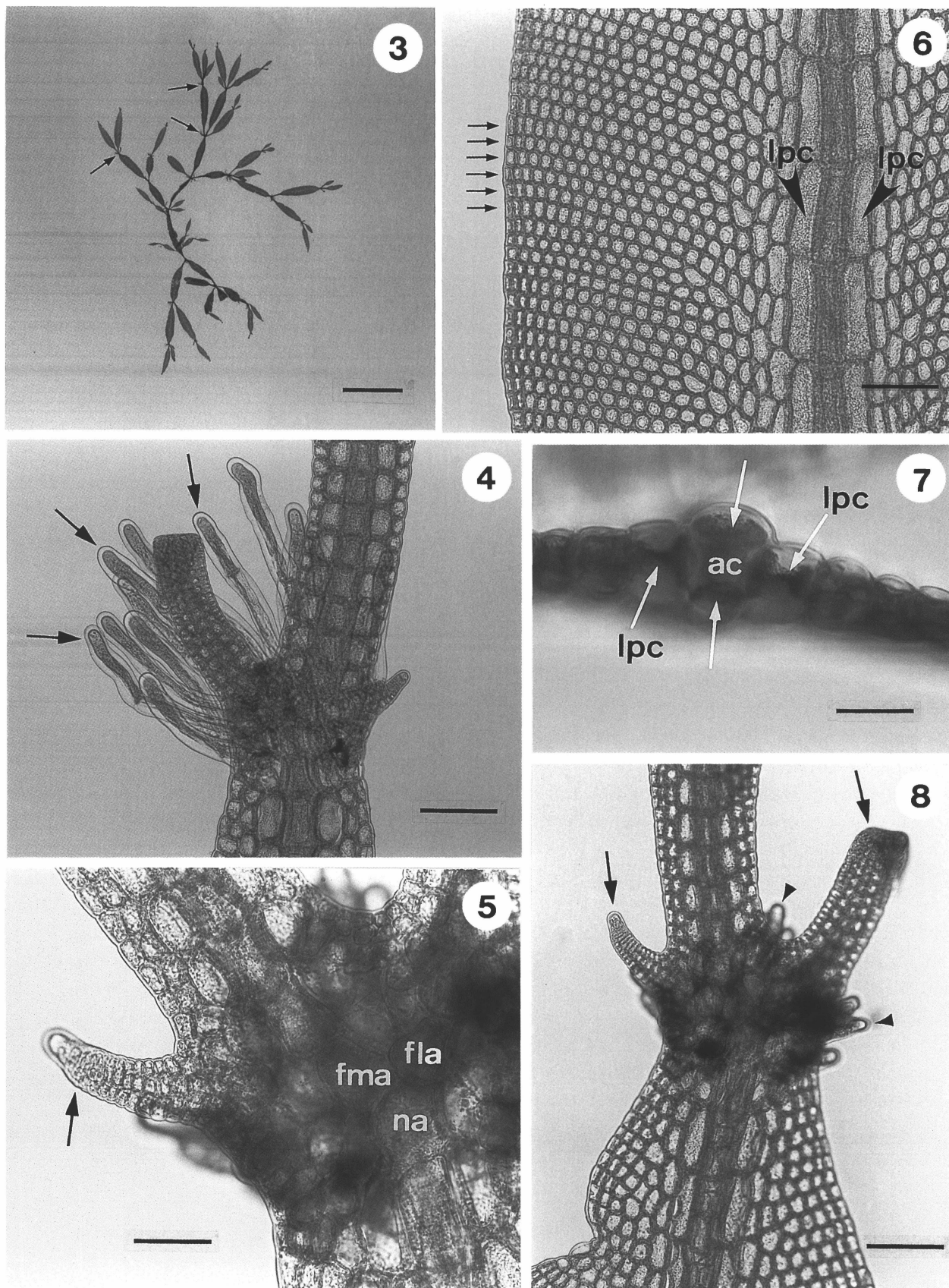
Thalli (Fig. 3) arching, loosely attached to the substratum and imbricate forming a mat-like weave, purple, epilithic, attached by clusters of rhizoids (Fig. 4); mature blades linear to narrowly elliptical, 0.7-1.5 (to 2.0) mm wide with 5.5-9.1 mm between strongly to moderately constricted nodes (Fig. 3); adventitious branches formed from lateral pericentral initials (Fig. 5); endogenous branches absent; middle rim consisting of an axial cell and 4 pericentral cells (Fig. 7), look like 3 rows of cylindrical or barrel-shaped cells in surface view (Fig. 6); second- and third-order cell-rows arising from lateral pericentral cells, (4-) 5-7 lateral second- and third-order cell rows produced by each axial cell at the central part of the blade (Fig. 6); rhizoids arising from the ventral pericentral cells of the node and first anterior axial cells (Figs. 4, 8); adventitious blades are formed laterally in the nodal region (Fig. 8); reproductive organs unknown.

**Specimens examined:** Sungai Kolok (ca. 6°N, 102°E), Thailand (H. Akiyama 31/III, 2000, specimen No.14790 at HYO)

**Habitat:** Attached to submerged stones, 10-20 cm below the surface of clear waters at the site slightly downstream from Sirindhorn Waterfall (100 m asl) in Sungai Kolok, Thailand.



**Fig. 2.** *Caloglossa beccarii* forming a mat-like purple weave on the submerged stones of clear stream waters in Sungai Kolok.



**Figs. 3-8.** Vegetative morphology of *Caloglossa beccarii*.

**3:** Whole thallus. The arrows indicate the nodes. **4:** Rhizoids (arrows) at the node. **5:** Adventitious branching (arrow) developed from the lateral pericentral of the first axial cell above a node. **6:** Internodal blade. The arrows indicate the second- and third-order cell rows. Middle rim consisting of an axial cell and 4 pericentral cells looks like 3 rows of cylindrical or barrel-shaped cells. **7:** Sectional view of middle rim consisting of an axial cell and 4 pericentral cells (arrows). **8:** Adventitious blades (arrows) formed laterally in the nodal region, and rhizoids (arrowheads) arising from the ventral pericentral cell of the node. (**lpc:** lateral pericentral cell; **fma:** first axial cell at the main axis; **fla:** first axial cell at the lateral axis; **na:** nodal axial cell; **ac:** axial cell. Bars = 1 cm in Fig. 3; 50  $\mu$ m in Figs. 4, 6, 8; 100  $\mu$ m in Figs. 5, 7.)

## Discussion

### Morphology

The specimen collected from Sungai Kolok in Thailand was identified as *Caloglossa beccarii* (Zanardini) De Toni: (i) adventitious branching, (ii) narrowly elliptical internode, blade not markedly constricted at nodes, and (iii) internodes usually 5.5-8.3 mm long, 5-7 lateral second- and third-order cell rows produced by each axial cell (King and Puttock, 1994).

*Caloglossa beccarii* resembles *C. stipitata* E. Post (1936) in many morphological features, but the latter is distinguished from the former in: (i) thallus internodes broadly elliptical, blades markedly constricted at the nodes, and (ii) internodes length usually 2.4-3.5 mm long, 4 or 5 lateral cell rows produced by each axial cell (King and Puttock, 1994).

Some of the specimens from Sungai Kolok reveal features close to *C. stipitata*. However, *C. stipitata* has not been reported from freshwater habitats.

### Distribution in Southeast Asia

According to Silva et al. (1996), *Caloglossa beccarii* (Zanardini) De Toni has been reported from Malaysia, Indonesia, Burma, and Singapore. The type locality of this species as *Delesseria beccarii* Zanardini is a freshwater stream near Gunung Pueh, western Sarawak, Malaysia on Borneo Island. On Borneo Island, another location of this species from Sungai Tutong, Brunei-Darussalam, has been reported by King and Puttock (1994). Both streams flow into the South China Sea.

A locality of this species has been reported as *Caloglossa ogasawaraensis* var. *latifolia* Kumano from Sungai Cherok, Malaysia on the western part of the Malay Peninsula, which flows into the Malacca Strait (Kumano, 1978). In the present study, this species was found from Sungai Kolok, Thailand on the eastern part of the Malay Peninsula, which flows into the South China Sea.

Thus, *Caloglossa beccarii* has one of its main

distributions in the regions along the southern part of the South China Sea.

### Acknowledgements

We would like to thank Dr. Mitsunobu Kamiya (Research Center for Inland Seas, Kobe University) for his valuable comments on earlier drafts of the manuscript.

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Received: November 28, 2000

Accepted: January 17, 2001