

Short Communication

**ADDITIONAL DESCRIPTIVE DATA FOR THE NEW COELACANTH,  
*Latimeria menadoensis* Pouyaud *et al.*  
FROM SULAWESI, INDONESIA**

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**Abstract**

*Morphometrics and meristics data of Latimeria menadoensis, a new species of Coelacanth from Sulawesi, Indonesia (Pouyaud et al. 1999) are reported. Comparison with data of L. chalumnae as reported by McAllister and Smith (1978) and Forey (1998) are presented. Among the 22 descriptive characters only 41% are different. Some more specimens of L. menadoensis are still needed for more detail study of its morphological differences with L. chalumnae.*

**Keywords:** *L. menadoensis*, description, *L. chalumnae*, morphometrics and meristics comparison.

**Introduction**

Following the discovery of the new Coelacanth popularly known as "King of the Sea" from North Sulawesi as reported by Erdmann *et al.* (1998) several papers have been published discussing and commenting this discovery (Erdmann, 1999; Erdmann *et al.*, 1999; Erdmann & Moosa, 1999; Forey, 1998, Gordon, 1998; Holder *et al.*, 1999; etc) Erdmann *et al.* (1998) stated that this new discovered specimen from Sulawesi was apparently *L. chalumnae* Smith, (1955). But, Forey (1998) stated that the specimen from Sulawesi must be a distinct population because the very long distance between Grand Comoro and Sulawesi (9000-10000 km) and the difference in sea current pattern between both areas make it impossible for *L. chalumnae* to stray from Comoro to Sulawesi. Additionally Fricke *et al.* (1991a) stated that *L. chalumnae* has a narrow habitat, and only migrates between caves (Fricke *et al.* 1991b).

However further observations concluded that the Sulawesi specimen was a new species, *L. menadoensis* (Pouyaud *et al.*, 1999). A complete description of the holotype has not been presented so far although it may provide the necessary basis for further research. Pouyaud *et al.* (1999) only mentioned the differences between the two species based on genetical evidence and added a few morphological data.

This paper presents the more complete morphometric and meristic description of the new species and its comparison with *L. chalumnae* as reported by McAllister and Smith (1978) and Forey (1998a).

### History of the discovery

The first specimen of *Latimeria menadoensis* was discovered by Dr. Mark V. Erdmann, a carcinologist/marine biologist from the University of California, who is working in Indonesia in the COREMAP project. The specimen was donated to the Museum Zoologicum Bogoriense (Zoology Division of the Research Centre for Biology, Indonesian Institute of Sciences or LIPI) through the kind advise of Dr. Kasim Moosa, senior carcinologist from the Research Centre for Oceanology, LIPI and COREMAP project coordinator. The specimen was caught offshore of Manado Tua Island, North Sulawesi on July 30, 1998 at a depth about 100-150 m. Erdmann already observed the fish in the same area on September 17, 1997, when a specimen was sold in a small market. A detailed account of this second finding has been reported by Erdmann *et al.* (1999) by applying the Coelacanth Conservation Council (CCC) inventory format of *L. chalumnae*.

### Description

#### *Latimeria menadoensis*

|                 |   |
|-----------------|---|
| Holotype        | : MZB 10003 (female)                                  |
| Locality        | : Offshore Manado Tua Island<br>1°38'N. nad 124°43'E. |
| Date            | : 30 July, 1998.                                      |
| Collector       | : Mark V. Erdmann.                                    |
| Total Length    | : 124 cm.   |
| Standart length | : 116 cm.   |



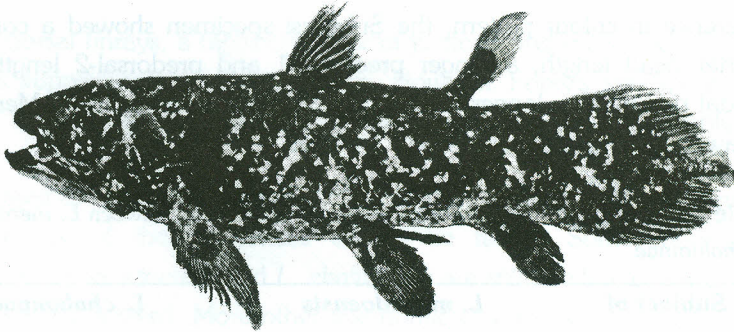


Figure 1. *Latimeria menadoensis*

Figure 1 shows the appearance of the fish. The head with its intracranial joint just behind the eye. The body is robust and has the characteristic lobed fins and filliform or denticulated scales. Two rows of small inward directed caninoid teeth of different size are present on both upper and lower jaws. Filliform teeth are found on vomer and palatine. The coarse cartilagenous tongue shows a fine fillous surface. There are fang like tubercles on the anterior six rays (weak spines) of the first dorsal fin and on the anterior rays of main caudal fin. There are 82 lateral line scales. The colour in fresh condition is almost uniformly brown with white irregular flecks or blotches. A brilliant gold deflexion on the back surface of body is noted. The colour became greyish when the specimen was preserved in formalin and afterward in alcohol. The measurement and meristic data following McAllister and Smith (1978) and Forey (1998a) are given in Table 1. This table includes a comparison with data taken on *L. chalumnae* as reported by McAllister and Smith (1978) and Forey (1998a)

### Discussion

Erdmann *et al.* (1998) and Erdmann *et al.* (1999) suggested that from a preliminary examination of the specimen it apparently appeared to be conspecific with *L. chalumnae* from Grand Comoro. We agreed with Forey (1998b) that this Sulawesi specimen must be from a distinct population of *L. chalumnae*. However, from the data in Table 1 we can see that among the 22 descriptive characters only 41% of the characters are different. Except for the

difference in colour pattern, the Sulawesi specimen showed a comparatively shorter head length, a longer predorsal-1 and predorsal-2 length, a longer caudal peduncle, a longer caudal fin and a longer gular plate. Meristically the Sulawesi specimen shows a lower number

Table 1. Comparative morphological and meristical data Between *L. menadoensis* and *L. chalumnae*

| Subject of Comparison                  | <i>L. menadoensis</i><br>(McAllister & Smith, 1978)   | <i>L. chalumnae</i><br>(Forey, 1998)                     |
|--|---|--|
| <b>Measurement (% Standart length)</b> |   |  |
| Head length                            | (23)  | (27-33)  |
| Pre-D1 length                          | (38)  | (40)   |
| Pre D2 length                          | (60)  | (63-65)  |
| Body depth                             | (20)  | (20-30)  |
| Caud. Peduncle Depth                   | 20  | 20-22  |
| Caud. Peduncle Length                  | (31)  | (26-28)  |
| Caudal or tail length                  | (16)  | (15)   |
| Pre-V. or pre-Pelvic length            | 45  | 43-48  |
| Pre-A length                           | 65  | -  |
| Snouth length                          | 7   | 4-9  |
| Orbital length (eye Ø)                 | 4   | 3-4  |
| Upper jaw length                       | 11  | 9-13   |
| Lower jaw length                       | 20  | 19-22  |
| Gular plate length                     | (17)  | (13-16)  |
| <b>Fin formula (number of rays)</b>    |   |  |
| D1/D2                                  | 8/(27)  | 8/ (27-31)   |
| P                                      | (33)  | (29-32)  |
| V                                      | 33  | 29-33  |
| A                                      | 29  | 28-30  |
| Main C                                 | (25/24)   | -  |
| Suppl C                                | (30)  | -  |
| <b>Scales :</b> Lat line               | 82  | 76-82  |
| <b>Colour</b>                          | Almost uniformly brown with irregular white flecks. Brilliant gold deflexion on the back and fin. Becoming greyish In formalin and alcohol. | Almost uniformly steel blue with irregular white flecks. |

(note : numbers in parentheses indicating distinction)



of second dorsal finrays, a higher number of pectoral and main caudal finrays as well as supplementary caudal finrays. However Forey's specimens were consist of three adults and two fetuses and *L. menadoensis* was only one specimen.

Based on the above facts the two species are only slightly different, but the significance of the differences cannot be tested. Some more adult specimens of *L. menadoensis* and *L. chalumnae* are still needed to observe the difference can be applied. More other taxonomic characters are still needed to be observed to find the real morphological difference of the two species. Holder *et al.* (1999) stated that scale ornamentation is one important taxonomic character following the suggestion of Forey and also the report of Erdmann *et al.* (1998). More detailed study of scale morphology and structure have been done by my fellows, Renny and Ike with the hope that their results can be used for further comparative study of *Latimeria*.

Genetic sequence analysis of the Sulawesi specimen which was done by Pouyaud *et al.* (1999) and Holder *et al.* (1999) gave different results in time of divergence estimates due to different substitution rate used or to other factors. However, they came to the same conclusion that *Latimeria* from Sulawesi represents a distinct species from *L. chalumnae* of Grand Comoro. Following Pouyaud *et al.* (1999), based on two different rates of sequence divergence (1% of nucleotidic substitution per million years for 12S rDNA and 2% of that for cytochrome b) the estimated divergence time of both population from their common ancestor was around 1.220.000 years with cytochrome b and around 1.420.000 years with 12S rDNA. Similar analysis for the mitochondria of *L. menadoensis* that was done by Holder *et al.* (1999) gave resultant the estimated time of divergence around 4.7 - 6.3 million years. All the above results are already reasonable times for speciation of relic population. The additional evidence of the very long distance in type localities between Comoro and Manado Tua Island and the difference in sea current pattern / distribution as well as their morphological and meristical differences are likely reasonable to regard *Latimeria* from North Sulawesi to be a different species. Overlapping some taxonomic characters of two related species (the same genus) are very common in animal or plant. This is the reason why Pouyaud *et al.* (1999) proposed its new species name, *Latimeria menadoensis*

for this Sulawesi specimen. From the morphological and meristical view point we realize that this data is still weak due to the fact that it still based on a single specimen from Sulawesi. It is hoped that in future studies more specimens can be collected to complete this diagnosis.

### **Etimology correction**

The species name "menadoensis" originated from the name of the capital of North Sulawesi province: 'Manado' (or Menado).

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