قسم : علم الحيوان .
كلية : العلوم - جامعة أسيوط.
رئيس القسم : أ.د / محمد خليل النفار.

بعض عظام الجمجمة ذات الأهمية التقسيمية في سمكتي لابيو هورى ولابيو فورسكليـاى

عبد الحميد خليل ، عزت يواقيم ، اسامه محمود

يتضمن هذا البحث دراسة مختصرة لمورفولوجيا العظم المصفوى العلوى ، العظم الجبهي ، العظم الميكعي ، العظم جارالوتدى والعظم اللامي الذيلي في جمجمة سمكتي لابيو هورى ولابيو فور سكلياى وقد أوضحت الدراسة أنه يمكن التمييز بين السمكتين موضع البحث عن طريق بعض النسب المورفومتريه للعظام السالفة الذكر.

Dept. of Zoology,
Faculty of Science, Assiut University,
Head of Dept. Prof. Dr. M. K. El-Nafar.

SOME SKULL BONES OF TAXONOMIC IMPORTANCE IN TWO NILE CYPRINOID FISHES LABEO HORIE AND LABEO FORSKALII FROM ASSIUT

(With One Table and 2 Figures)

By
A.KHALIL, E.G. YOAKIM and U.M. MAHMOUD

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SUMMARY

The morphology of the supraethomid, frontals, vomer, parasphenoid and urohyal of Labeo horie and Labeo forskalii was briefly described. Morphometric ratios of those bones, reliable for the discrimination between the two species considered, were determined.

INTRODUCTION

Some authors made use of the morphometric ratios of certain skull bones for establishing the taxonomic status of some fish species (WEITZMAN, 1962 & 1964; ROBERTS, 1969 & 1974; QADRI, 1974; KUSAKA, 1975 and WINTERBOTTOM, 1980). Although the morphology of the different elements of the skulls of some Nile fishes was studied (NAWAR, 1954; HAMMOUDA, 1958; BISHAI, 1967 and YOUSSEF, 1974), no trials have been made to determine the taxonomic importance of those elements. The present investigation is mainly concerned with some skull bones of two Nile cyprinoid fishes, Labeo horie and Labeo forskalii, from a taxonomic point of view. Only a brief description of the morphology of such bones will be given.

MATERIALS and METHODS

For the preparation of skulls, specimens of L. horie and L. forskalii (180 - 440 mm and 260 - 540 mm in standard length respectively) were boiled in water for few minutes. Soft tissues were carefully removed and the bones were placed in a mixture of hydrogen peroxide and water of the ratio 1:3 for about two days. The removal of the remaining soft tissues was then repeated followed by washing in warm water. After drying, the bones were put for one day in benzol to dissolve the adhering fats and then they were replaced in the sun for bleaching.

After a general survey of the skull bones of the fishes under investigation and reviewing the literature concerning taxonomically important fish skull bones (QADRI, 1964 & 1974 and KUSKA, 1975), only the following skull bones were considered: supraethmoid, frontals, vomer, parasphenoid and urohyal. Measurements on such bones are shown in (Fig. 1). For each species under investigation, the following morphometric ratios (expressed as percentages) were calculated:

(a) The supraethmoid length to the supraethmoid width (L/W).
(b) The frontal width to the frontal length (W/L).
(c) The vomer width to the vomer length (W/L).
(d) The parasphenoid length to the head length (L/H.L).
(e) The urohyal length to the head length (U.L/H.L).
(f) The urohyal height to the urohyal length (U.H/U.L).
(g) The urohyal width to the urohyal length (U.W/U.L).

The significance of differences between the mean values of the percental morphometric ratios of the fishes under investigation was testified by the analyses of variance and covariance according to SIMPSON et al. (1960).

RESULTS

In both fishes under investigation, the supraethmoid is a large median dorsal bone and represents the most anterior element on the dorsal surface of the cranium. Its dorsal surface is slightly concave towards the lateral and posterior edges. The supraethmoid possesses two lateral curved transverse processes. The most antero-lateral parts of the supraethmoid are in the form of two triangular flat extensions which are slightly lower than the level of the bone. The anteromedian tip of the supraethmoid is notched in L. forskalii (Fig. 2).

In both fishes under investigation, the forntals are the most extensive and conspicuous bones of the median dorsal series and they take a great part in the formation of the cranial roof. They are paired bones and they articulate medially by a distinct suture. The articulation between the fronatls is noticed along their whole lengths. The inner edges of the frontals are slightly lowered than the level of the bones. (Fig. 2).

In both fishes considered, the vomer is a single large bone which lies in the anterior region of the palate, just below the supraethmoid and frontals. It is V-shaped in L. horie, whereas it is T-shaped in L. forskalii.

In both fishes under investigation, the parasphenoid is a single elongated bone found in the mid ventral line of the cranium and extends from the posterior aspect of the vomer anteriorly to the basioccipital posteriorly. It is composed of a broad middle portion and two limbs, an anterior long limb and a posterior short one. The middle broad portion of the parasphenoid is, more or less, stout. It is provided with two pairs of equally developed transverse processes in L. forskalii and with only one pair of such processes in L. horie. The anterior limb is elongated in L. horie, while it is club-shaped in L. forskalii. The posterior short limb, in both species, is deeply notched posteriorly and interdigitates with the basioccipital (Fig. 2).

In both fishes considered, the urohyal is a single median element enclosed anteriorly between the two rami of the hyoid arch. It is composed of a ventral bony plate and a dorsal vertical bony lamella. The ventral plate of the urohyal is thin, weakly ossified and triangular in shape. Anteriorly the plate is produced into a thick head which is shaped as double O. In total view, the urohyal has an aeroplane tail shape (Fig. 2).

The ranges, means and standard deviation of the percental morphometric ratios considered for the supraethmoid, frontal, vomer, parasphenoid and urohyal of L. horie and L. forskalii are presented in Table 1. Analyses of variance and covariance revealed that, but for the mean percental value of W/L of the frontal bone, all the mean values of percental morphometric ratios of the skull bones considered for L. horie were highly significanctly different from those of L. forskalii ($P < 0.01$).

DISCUSSION

Discrimination between fish species in terms of the percental morphometric ratios of some of their skull bones was reported by some authors. QADRI (1974) used the mean percental value of W/L ratio of each of the supraethmoid, frontal and vomer to verify the taxonomic status of Salvelinus alpinus complex. KUSAKA (1975) differentiated between 29 fish species belonging to 5 families of the suborder Clupeoidei by using some percental morphometeric ratios of the urohyal bone. WINTERBOTTOM (1980), making use of the percental ratio of the maximum height of the quadrate to its total length, was able to differentiate between Pseudanos trimaculatus, Pseudanos gracilis and Anostomus spiloclistron.

The urohyal bone of L. horie and L. forskalii has an aeroplane-tail shape in total view. Such shape of the urohyal bone was considered by KUSAKA (1974) as characteristic for cyprinoid fishes. According to him, the urohyal features are useful for classifying teleostean fishes as they leave enough possibility to discriminate between nearly related species.

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EXPLANATION OF FIGURES

Fig. 1: Measuremetnts of some skull bones. Abbreviations-SE, dorsal view of supraethomid; L, maximum length, W, maximum width. F, dorsal view of the frontal; L, maximum length, W, maximum width. V, ventral view of the vomer; L, maximum length, W, maximum width. P, ventral view of the parasphenoid; L. maximum length. Ua, lateral view of the urohyal; L, maximum length, H, maximum height. Ub, ventral view of the urohyal; W, maximum width.

Fig. 2: Some skull bones of L. horie and L. forskalii. Abbreviations as in Fig. 1.

Table 1: The ranges, means and standard deviation of certain percental morphometric ratios of some skull bones of L. horie and L. forskalii.

	L. horie			L. forskalii		
	No.of fish	Range	$\bar{X}$±S.D.	No.of fish	Range	$\bar{X}$±S.D.
Supraethmoid						
L/W	38	37.42-65.00	50.66±6.00	24	72.00-96.00	82.88±5.54
Frontal						
W/L	38	62.96-86.84	72.50±4.82	20	67.31-80.85	74.50±3.73
Vomer						
W/L	19	68.18-93.10	83.32±6.44	21	55.88-81.48	68.99±5.93
Parasphenoid						
L/H.L	27	61.25-78.57	69.18±3.59	24	58.46-78.43	63.53±4.03
Urohyal						
U.L/H.L	19	32.73-40.00	36.19±2.25	14	19.66-27.36	23.92±1.85
U.H/U.L	9	34.38-42.11	38.00±2.59	14	46.43-60.87	53.47±3.80
U.W/U.L	9	22.50-36.11	30.82±4.22	14	32.14-45.83	39.83±4.21

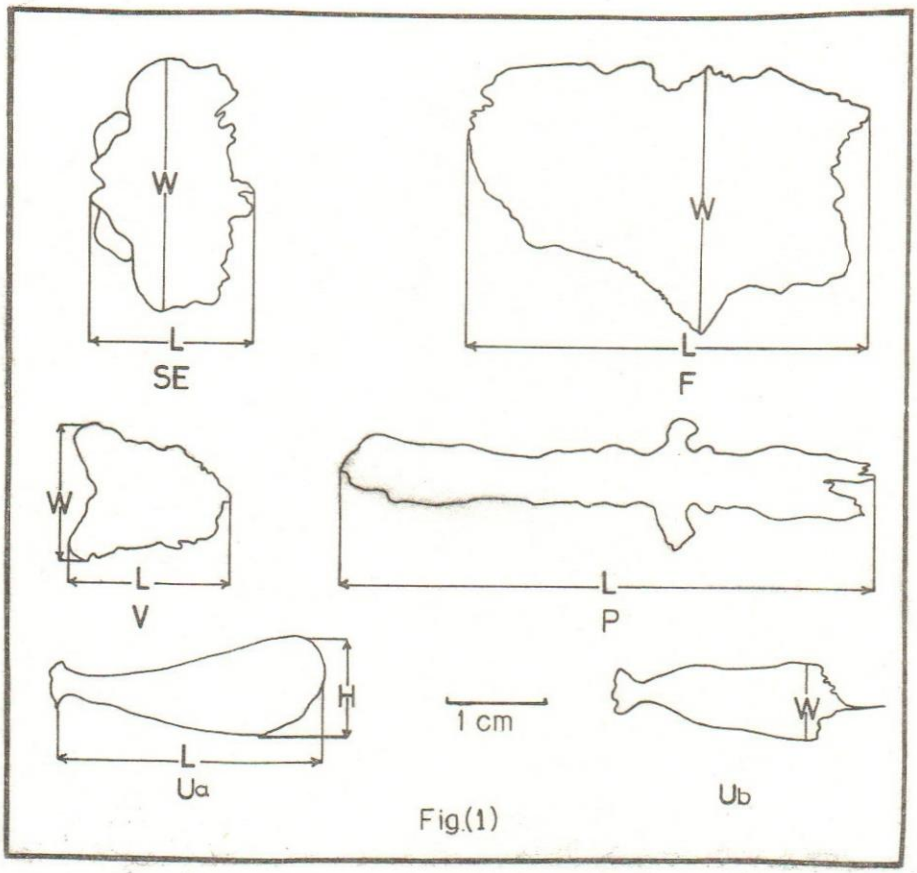

Fig.(1)

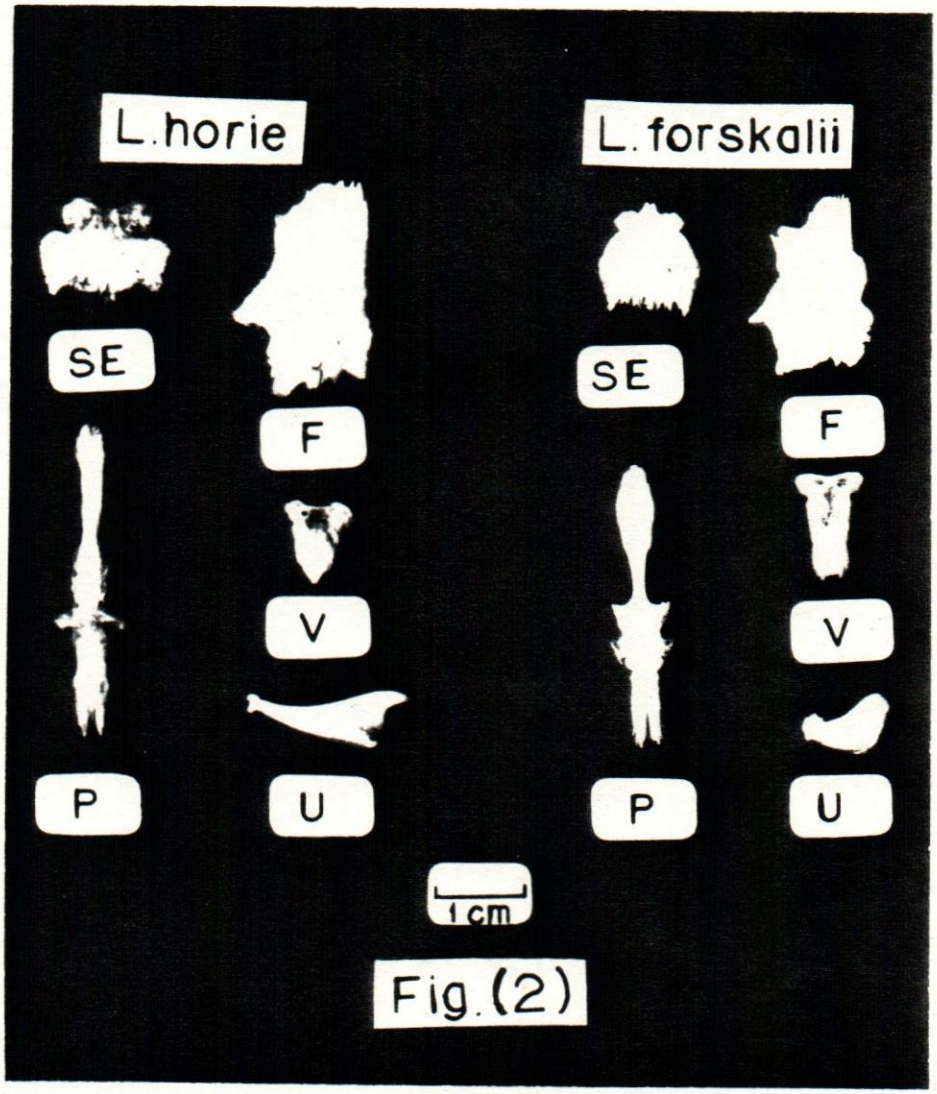

Fig.(2)