

Notes on *Barbus graellsii* STEINDACHNER, 1866

By CARLOS ALMAÇA ¹⁾

Manuskript eingelangt am 26. November 1981

Summary

The study of some type-specimens of *Barbus graellsii* STEINDACHNER, 1866 (22 spec.) and of *Barbus guiraonis* STEINDACHNER, 1866 (21 spec.) of the Naturhistorisches Museum Wien is presented in this paper. The results of that study are as follows: (1) *B. guiraonis* is a synonym of *B. graellsii*, as STEINDACHNER (1866c) first stated; (2) *B. graellsii* is not a subspecies of *B. meridionalis* RISSO, 1826, but a distinct well defined Iberian species. *B. meridionalis* too lives in Spain and data about its Iberian geographical distribution are also included.

Die Arbeit stellt eine Studie von Typenmaterial von *Barbus graellsii* und von *Barbus guiraonis* STD. 1866 dar. Es ergaben sich folgende Resultate: (1) *B. guiraonis* ist, wie STEINDACHNER (1866c) bereits erkannte, ein Synonym von *B. graellsii*; (2) *B. graellsii* ist nicht als eine Unterart von *Barbus meridionalis* RISSO 1826 sondern als eine eigene klar abgegrenzte iberische Art anzusehen. Über die ebenfalls in Spanien vorkommende *B. meridionalis* werden Verbreitungsangaben gemacht.

This work has been supported by a grant of the Instituto Nacional de Investigação Científica (Lisbon). I heartly thank Dr. R. HACKER and Mr. H. AHNELT (Fisch-Sammlung, Naturhistorisches Museum Wien) for their kind hospitality and constant co-operation. I thank Mr. I. DOADRIO for the offer of a sample of *B. meridionalis* from Spain.

Introduction

STEINDACHNER (1866a) described *Barbus graellsii* based on specimens from the Ebro (near Tortosa, Zaragoza and Logroño), streams near Arenas (North of Bilbao), and the Nervion (near Bilbao). As diagnostic characteristics of this species were pointed out the absence of denticles on the last unsegmented ray of the dorsal and the long posterior barbels (STEINDACHNER, 1866a).

In his next paper on the Iberian freshwater fishes, the same author (STEINDACHNER, 1866b) described a new species, *Barbus guiraonis*, from the Jucar (near Cuenca), which is also characterized by the absence of denticles on the last unbranched ray of the dorsal. According to STEINDACHNER (1866b),

¹⁾ Adress: Prof. Dr. Carlos ALMAÇA, Laboratório de Zoologia, Faculdade de CIÊNCIAS, Rua da Escola Politécnica, 1294 Lisboa Codex, Portugal.

B. guiraonis would be distinct from *B. graellsii* by its lower, stronger and rounder body, and shorter barbels and caudal.

Later on, STEINDACHNER (1866c) considered *B. guiraonis* as a synonym of *B. graellsii* and pointed out the affinities of this species with *B. caninus* BONAP.²⁾ Prior references of this last species from the Province of Valencia were refuted by STEINDACHNER (1866c) on the basis of a probably erroneous identification of young speckled specimens of *B. graellsii* (= *B. guiraonis*) with *B. caninus*. According to the same author (STEINDACHNER, 1866c), *B. caninus* would be different from *B. graellsii* by its smaller and more numerous scales, and shorter barbels.

GÜNTHER (1868) considered *B. graellsii* as scarcely distinct from *B. caninus*, and *B. guiraonis* as a synonym of *B. caninus*. However, GÜNTHER apparently did not examine any specimen of one or the other Iberian forms.

MERTENS (1924), based on five juvenile specimens, recognizes the presence of *B. meridionalis* (Risso, 1826) in the Province of Barcelona, and of *B. graellsii* in the Ebro. The same author includes *B. graellsii* and *B. guiraonis* in the "Formenkreis" of *B. meridionalis*.

KOLLER (1926) refers to *B. guiraonis* as a synonym of *B. meridionalis* and *graellsii* as the Iberian subspecies of *B. meridionalis*. However, according to KOLLER the subspecies *meridionalis* would also live in Spain, in the Pyrenean region.

PELLEGRIN (1930) confirms the presence of *B. meridionalis* in Spain (eastwards of the Pyrenees, along the littoral, up to Figueras), and mentions *B. graellsii* (and *B. guiraonis*, whose identity with *graellsii* is accepted by Pellegrin) from many localities. BERG (1932) and DE BUEN (1935) follow PELLEGRIN (1930), quoting both species, *B. meridionalis* and *B. graellsii* (including *guiraonis*), to Spain.

REY (1947) stated that he never studied undoubtedly *B. meridionalis meridionalis* specimens from Spain. Only one specimen, too young, from Rio Manol (Figueras), had been identified by L. REY as *B. meridionalis meridionalis*. According to REY, *graellsii* (and its synonym *guiraonis*) is an Iberian subspecies of *B. meridionalis*. This taxonomic position of *graellsii* has been accepted by recent authors like, for instance, BANARESCU et al. (1971), and ALMAÇA (1971, 1981).

KARAMAN (1971) considers *guiraonis* and *graellsii* as distinct forms: *guiraonis* as a natio of *B. capito bocagei* (STEINDACHNER, 1865), and *graellsii* as another subspecies of *B. capito* (GÜLDENSTÄDT, 1773).

ALMAÇA (in press) suggests that *graellsii* is a good species, distinct from *B. meridionalis*.

²⁾ The authorship of *Barbus caninus* has often been attributed to BONAPARTE. VALENCIENNES in CUVIER et VALENCIENNES, 1842. Hist. Nat. Poiss., 16: 142–143, seems, however, to be the valid author (ALMAÇA, 1968).

In the present paper evidence will be presented in order to prove that: (1) the differences between the nominal species *B. graellsii* and *B. guiraonis* do not justify their inclusion on distinct taxa; (2) *B. graellsii* is a good species largely distinct from *B. meridionalis*; (3) this last species also lives in Spain, its geographical range extending far from the Pyrenean region.

Material

The original descriptions of both nominal species *Barbus graellsii* and *B. guiraonis* were based on several specimens (STEINDACHNER, 1866a, b). Presumably, the type-series were large as can be inferred by reading the registry book of the Fisch Sammlung (Naturhistorisches Museum Wien). Therefore, all those specimens probably are syntypes and the examined ones surely are as can be deduced from the localities and dates registred on their labels. However, the localization of all the syntypes of *B. graellsii* and *B. guiraonis* was not possible.

The listing of the examined syntypes is as follows:

Barbus graellsii STEINDACHNER, 1866

NMW 5340: 1 spec., Ebro, 1865 (1864 Juni), STEIND. coll.; NMW 54139: 2 spec., Ebro bei Tortosa, 1864, STEIND. coll. (the larger specimen has no pelvic fins); NMW 54140: 1 spec., Tortosa, Juni 1864 (a), STEIND. coll.; NMW 54141: 2 spec., Tortosa, Ebro, 1864, a, STEIND.; NMW 54143: 1 spec., Rio Nervion, Bilbao, Aug. 1864 b., STEIND. coll.; NMW 54150: 1 spec., Tortosa, Ebro, Juni 1864 (b), STEIND. coll.; NMW 54146: 10 juv. spec., Ebro bei Logroño, 1864 f., STEIND. coll. & don.; NMW 54151: 2 spec., Ebro, Zaragoza, 1864 (Juni), STEIND. coll.; NMW 54154: 1 spec., Logroño, Ebro, 1864, STEIND. coll.; NMW 54156: 2 spec., Zaragoza, Ebro, 1864 Juni (3), STEIND. coll.

Barbus guiraonis STEINDACHNER, 1866

NMW 5291: 1 spec., Cuenca, Rio Jucar, 1865, STEIND. don.; NMW 5307—09: 3 spec., Rio Jucar, Cuenca, 1865, STEIND. coll.; NMW 5310: 1 spec., Cuenca, Rio Jucar, 1865, STEIND. coll.; NMW 54124: 1 spec., Cuenca, Rio Jucar, 1865 a, STEIND. don.; NMW 54125: 2 spec., Jucar, Cuenca, Apr. 1865 e, STEIND. coll.; NMW 54127: 2 spec., Jucar, Cuenca, 1865 Apr. b., STEIND. coll.; NMW 54128: 2 spec., Jucar, Cuenca, Apr. 1865, STEIND. coll.; NMW 54129: 2 spec., Jucar, Cuenca, Apr. 1865 d., STEIND. coll.; NMW 54130: 2 spec., Jucar, Cuenca, Apr. 1865 c., STEIND. coll.; NMW 54131: 2 spec., Jucar, Cuenca, Apr. 1865 a., STEIND. coll.; NMW 54132: 2 spec., Cuenca, Rio Jucar, 1865 d., STEIND. coll. (the smaller specimen of this sample, total length: 92 mm, is a juvenile of *Barbus bocagei*); NMW 54133: 2 spec., Jucar, Cuenca, Apr. 1865 f., STEIND. coll.

A small sample of *B. meridionalis meridionalis* recolted in Spain and offered by Ignazio DOADRIO could also be examined: 77091617 and 77091626: 2 spec., Rio Matarraña, Valdetorres (Teruel), 16. 9. 77, 21—23h, DOADRIO coll. & leg.; 78072906 and 78072908: 2 spec., Rio Tordera, Sta M^a de Palantordera (Gerona), 29. 7. 78, DOADRIO coll. & leg..

Differences between syntypes of *Barbus graellsii* and *B. guiraonis*

All the syntypes examined of both nominal species are taken into account in the comparison, with the exception, naturally, of the juvenile *B. bocagei*

mentioned before (NMW 54132). However, not all the specimens are in conditions good enough to measure or count each variable. So, the samples size concerning the continuous or discrete variables ought to be reduced as shown in table 1.

The main differences concerning both type-series are as follows: (1) body-size, (2) relative size of the head, (3) gill rakers, (4) barbels, and (5) relative size of the pelvics.

B. guiraonis specimens are smaller than *B. graellsii* ones. The mean values of the total lengths of the studied samples differ in about 100 mm and the upper limits of the ranges in about 125 mm (table 1). Dark speckles are irregularly outlined (as in *B. meridionalis* or juvenile *B. bocagei*) and are often present on the back of juvenile specimens (up to total lengths of 110 mm in *B. graellsii* and 150 mm in *B. guiraonis*).

Relatively to the total length the head length is greater in *B. guiraonis* (table 1). A similar situation is found for instance in *B. microcephalus* ALMAÇA, 1967, where the relative size of the head is greater in smaller than in larger specimens (ALMAÇA, in press).

The average, and the maximum and minimum values of the gill rakers range are greater in *B. graellsii* (table 1). The gill rakers are higher in *B. graellsii*. The relationship between the number and size of gill rakers with the feeding strategy is not completely understood (HYATT, 1979), but it seems that environmental factors could explain some quantitative differences (VIBERT and LAGLER, 1961).

Comperisom of some variates in nominal species *Barbus graellsii* and *B. guiraonis*.

Table 1

	<i>Barbus graellsii</i>			<i>Barbus guiraonis</i>		
Sample size	14			21		
Total lengths (mm)	(78)	250	(350)	(102)	148,5	(223)
Scales	8-9(10)/47-50/5-6			(7)8-9(10)/(46)48-52(53)/(5)6		
Gill rakers	(16)	17,4	(19)	(13)	15,4	(17)
Pharyngeal teeth	4+3+2			4+3+2		
Ratios:						
Total length/Head length	(4,7)	5,1	(5,4)	(4,3)	4,6	(4,9)
Total length/Pelvic height	(7,2)	7,5	(7,8)	(7,7)	8,3	(8,8)
Total length/Pectoral height	(6,1)	6,5	(6,9)	(6,2)	6,8	(7,5)
Head length/Preorbital length	(2,4)	2,6	(2,8)	(2,4)	2,7	(3,1)
Anal height/height of the last unbranched dorsal ray	(0,95)	1,00	(1,09)	(0,89)	0,97	(1,14)

In *B. graellsii* the barbels are longer: the anterior barbel reaches (most frequently) the middle of the eye, in *B. guiraonis* the anterior margin of the eye. The posterior barbel reaches or exceeds, in *B. graellsii*, the angle of the

preopercular, while in *B. guiraonis* it usually reaches the posterior margin of the eye or, less commonly, the angle of the preopercular.

Relatively to the total length the pelvics are higher in *B. graellsii* (table 1).

Some of these and other characteristics are shown in table 1. With the exception of the row "Scales" the numbers into brackets represent the lowest and highest values of the observed ranges and the central values the means. In the row "Scales" the numbers into brackets were rarely observed.

None of these small differences seem to justify the taxonomic separation of *B. graellsii* and *B. guiraonis*. In fact, they can be explained by the outstanding distinction between the mean and higher values of the body size in both samples. It is also possible that ecological differences between the localities where the two nominal species were captured could contribute to the small qualitative and quantitative observed differences. Therefore, *B. guiraonis* must be considered, as STEINDACHNER (1866c) did, a synonym of *B. graellsii*. The erroneous inclusion of *B. guiraonis* in *B. bocagei* (see KARAMAN, 1971) will be best discussed in the next section.

Description of *B. graellsii* STEINDACHNER, 1866

Head comprised 4,3–5,4 times in the total length. Head profile slightly convex or rectilinear, sometimes depressed or flattened forward the nostrils. Eye near the head profile, often tangent to it. Mouth inferior. Lips moderately thick, the lower lip without a defined median lobe, but very often slightly tripartite. In some specimens (about 0,10 of the observed samples) the lower lip presents a horny cover. The nose is comprised 2,4–3,1 times in the head length. Barbels thin, the anterior barbel reaching a point between the anterior edge and the middle of the eye, and the posterior one reaching the rear edge of the eye or the preopercular; sometimes it exceeds the preopercular.

Coloration of fixed specimens darker above than below the lateral line. Juvenile specimens may present dark irregularly outlined speckles on the back. These speckles appear in specimens shorter than 150 mm.

Origin of the dorsal ahead the origin of the pelvic fins. The tip of the dorsal fin laid down does not reach the origin of the anal. Upper profile of the dorsal rectilinear or slightly concave and oblique to the back. Dorsal: 4' + 8, the last branched ray being bifurcated (in one specimen the dorsal has only 7 branched rays, the last one also bifurcated). Last unbranched ray weak and without denticles posteriorly. In some juvenile specimens (shorter than 150 mm), however, there are a few very small and spread triangular denticles or an undulation. The denticles are only visible with appreciable binocular magnifications (I made use of 25,2×) and, though scattered, their density is never lower than 2 denticles/mm; the denticulated portion of the last unbranched ray is always lower than 1/6 of its height. In juvenile specimens of *B. bocagei* smaller than 150 mm, the denticles are much bigger, perfectly visible (without binocular) and the denticulated portion of the last unbranched ray spreads over 1/2–2/3

of its height (ALMAÇA, in press). Therefore, the inclusion of *B. guiraonis* into *B. bocagei* suggested by KARAMAN (1971) is erroneous.

The height of the pectoral is comprised 6,1—7,5 times, and the height of the pelvic 7,2—8,8 times, in the total length.

Tip of the anal laid down generally reaches the outer rays of the caudal fin. Anal: 3' + 5, the last branched ray being bifurcated. Height of the anal comprising 0,89—1,14 times the height of the last unbranched dorsal ray.

Scales: (7) 8—9 (10/(46) 47—52 (53)/5—6.

Gill rakers: (13) 16,2 (19)

Pharyngeal teeth: 4+3+2, hooked or weared, the fourth of the outer row bigger, more globose and pointed.

Comparison of *B. graellsii* and *B. meridionalis*

B. meridionalis meridionalis has often been referred to Spain, generally on the basis of juvenile specimens (see Introduction). The taxonomy of *Barbus* presents many difficulties, mainly when young specimens are concerned.

So, it was not clear if the authors referring to *B. meridionalis* had actually examined specimens of that form or juveniles of *B. graellsii* which was for a long time considered as a subspecies of *B. meridionalis* and whose juveniles often present dark speckles.

B. meridionalis meridionalis lives in Spain and, on the basis of the samples examined (see Material), its geographical area largely exceeds the Pyrenean region (BANARESCU et al., 1971). The main differences relatively to *B. graellsii* are as follows (see also ALMAÇA, 1981).

Lips thicker, the lower lip with a well defined median lobe. Barbels thicker and shorter than in *B. graellsii*: the anterior barbel reaches the front edge of the eye and the rear one reaches or exceeds the rear edge of the eye. Body, even in adults, with dark speckles on the back and dorsal and caudal fins. Tip of the anal laid down often exceeding largely the outer rays of the caudal fin. Scales: 9—11/46—51/6—7, i. e. more numerous between the basis of the last unbranched dorsal ray and the lateral line and this one and the basis of the pelvic. Gill rakers: 8—11, lower and less numerous than in *B. graellsii*. Pharyngeal teeth: 5+3+2, hooked, the fourth of the external row slightly bigger than the third, and the fifth the smallest of the external row. Caudal lobes smaller and rounder than in *B. graellsii*.

This group of differences clearly shows that *B. graellsii* and *B. meridionalis* are distinct species. One of them, however, must be stressed: the number and form of the pharyngeal teeth. While *B. graellsii* presents the typical pattern of Iberian species, i. e. four external teeth, of which the fourth is bigger, globose and pointed, *B. meridionalis* exhibits the pattern of Centro-European *Barbus*, i. e. five external teeth, the fourth just a little bigger than the third, hooked like this one, and the fifth the smaller of the external row. It must be added

that a very similar pattern to the Iberian is also present in some Middle East species (ALMAÇA, 1981).

The geographical range of both species is partially overlapping in Spain (*B. meridionalis* apparently lives from the Pyrenan region to the Province of Teruel; see "Material"). However, available uncontroversial data are not enough to definitely establish their ecological sympatry.

References

- ALMAÇA, C. (1968): Révision critique de quelques types de Cyprinidés d'Europe et d'Afrique du Nord des collections du Muséum National d'Histoire Naturelle. — Bull. Mus. natn. Hist. nat., Paris, 2^e Série, 40 (6): 1116—1144.
- (1971): Sur la collection de Barbeaux (Genre et Sous-genre *Barbus*) ibériques et nord-africains du Forschungsinstitut Senckenberg (Frankfurt a. M.). — Arq. Mus. Boc., 2^a Série, 3 Not. Supl. n° 21: I—IV.
- (1981): La collection de *Barbus* de l'Europe du Muséum national d'Histoire Naturelle (Paris). — Bull. Mus. natn. Hist. nat., Paris, Section A, n° 1.
- (in press): Barbels of the Iberian Peninsula (Pisces, Cyprinidae, *Barbus*). — I Jornadas de Ictiología Ibérica, Leon, España (Maio de 1981).
- BANARESCU, P., M. BLANC, J.-L. GAUDET and J.-C. HUREAU (1971): European Inland water fish. — FAO and Fishing News, London.
- BERG, L. S. (1932): Übersicht der Verbreitung der Süßwasserfische Europas. — Zoogeographica, 1 (2): 107—208.
- DE BUEN, F. (1935): Catálogo de los Peces ibéricos: de la planicie continental, aguas dulces, pelagicos y de los abismos próximos. — Primera Conferencia Oceanográfica Ibero-Americana, Madrid (1935), 89 pp.
- GÜNTHER, A. (1868): Catalogue of the Fishes in the British Museum. — 7. Brit. Mus., London.
- HYATT, K. D. (1979): Feeding strategy. — In: Fish Physiology, Hoar, W. S., D. J. RANDALL, and J. R. BRETT, eds., 3: 71—119.
- KARAMAN, M. S. (1971): Süßwasserfische der Türkei. 8. Teil. Revision der Barben Europas, Vorderasiens und Nordafrikas. — Mitt. Hamburg. Zool. Mus. Inst., 67: 175—254.
- KOLLER, O. (1926): Eine kritische Übersicht über die bisher beschriebenen mittel- und südeuropäischen Arten der Cyprinidengattung *Barbus* Cuv. — Sitzungsberichte d. mathem.-naturw. Kl., 135: 167—202.
- MERTENS, R. (1924): Fische aus dem nördlichen und östlichen Spanien. — Arch. f. Naturgesch., Abt. A, 11: 1—4.
- PELLEGRIN, J. (1930): Les Barbeaux d'Espagne. — Bull. Mus. natn. Hist. nat., Paris, 2^eS., 2 (5): 510—515.
- REY, L. L. (1974): Peces Ganoideos y Fisóstomos. — Mem. R. Acad. Cien. Ex., Fís. y Nat. Madrid, 11: 1—839.
- STEINDACHNER, F. (1866a): Ichthyologischer Bericht über eine nach Spanien und Portugal unternommene Reise. (Fortsetzung). Über die Fische des Ebro und der Flüsse bei Bilbao. — Sitzungsber. der kais. Akad. der Wissenschaften, 53: 198—204.
- (1866b): Id. (Zweite Fortsetzung). Über die Fische des Tajo (portug. Tejo), Duero (portug. Douro), Miño (portug. Minho), deren Nebenflüssen und aus dem Jucar bei Cuenca. — Ibid., 54: 6—27.
- (1866c): Allgemeine Bemerkungen über die Süßwasserfische Spaniens und Portugals und Revision der einzelnen Arten. — Selbstverlag des Verfassers, Wien. pp. 1—15.
- VIBERT, R. et K. F. LAGLER (1961): Pêches continentales. Biologie et aménagement. — Dunod, Paris.