

## **HYLA MERIDIONALIS FROM THE LATE PLEISTOCENE (LAST INTERGLACIAL AGE: IPSWICHIAN) OF BRITAIN**

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### **INTRODUCTION**

Hallock et al. (1990) reported *Hyla* sp. from the Late Pleistocene sediments of the Itteringham Gravel Pit (National Grid Reference 139305) in Norfolk. The detritus muds that contained the *Hyla* remains (as well as other small vertebrates) were interpreted as representing the Last Interglacial Age (Ipswichian) of the Pleistocene. Other exotic herptiles in the Itteringham fauna were *Rana* "esculenta" or *ridibunda* and *Emys orbicularis*.

At the time the Itteringham amphibian and reptile fossils were reported, only two modern skeletons of European *Hyla* (both *H. arborea*) were available to authors. In August, 1992, I studied at the Museo Nacional Ciencias Naturales, Madrid, Spain, where I was able to examine four additional modern skeletons of *Hyla arborea* as well as eight skeletons of the other European species, *H. meridionalis*. After the study of the new material, I suggest that the Itteringham fossil represents *H. meridionalis*.

### **SYSTEMATIC PALAEOLOGY**

Class Amphibia Linnaeus, 1758  
Order Anura Rafinesque, 1815  
Family Hylidae Gray, 1825  
Genus *Hyla* Laurenti, 1768

The Family Hylidae is represented in Europe by only two species, both in the genus *Hyla*. Modern *Hyla arborea* may be distinguished from *H. meridionalis* by its prominent lateral stripe which is missing in the latter species.

*Hyla arborea* occurs widely on the European continent, but there is a gap in its distribution in southern France and it does not occur in southeastern Iberia (Arnold and Burton, 1978; Escriva, 1987). *Hyla meridionalis* has a more restrictive distribution and occurs in southern France, extreme northeastern Spain and extreme northwestern Italy; then with a gap in Iberia except for about the southwestern one-third of the peninsula (Arnold and Burton, 1978; Escriva, 1987).

Neither species occurs naturally in Britain today, although *Hyla arborea* has been introduced from time to time in southern England and on the Isle of Wight, but in only one or two cases have there been any extended periods of breeding (Frazer, 1983).

*Hyla meridionalis* Boettger, 1874

*Material.* — Right ilium, Cromer Museum, Norfolk, Itt. No. 3.

*Remarks.* — Terminology used here follows Chantell (1964) who refers to the elevated structure on the ilium of the Hylidae that lies above the acetabulum as the **dorsal prominence** and the rounded structure that occurs on the lateral side of the dorsal prominence as the **dorsal protuberance** (Fig. 1a).

In the six modern skeletons of *Hyla arborea* and eight modern skeletons of *Hyla meridionalis* studied it was obvious that the dorsal prominence/protuberance complex differed in the two species. In *Hyla arborea* the prominence is low and the protuberance is elevated above the

prominence (Fig. 1b). In *Hyla meridionalis* the prominence is higher and triangular in shape and the protuberance occurs lateral to the prominence (Fig. 1a). The ilium from the Itteringham fossil locality resembles *Hyla meridionalis* in this character (Fig. 1c).

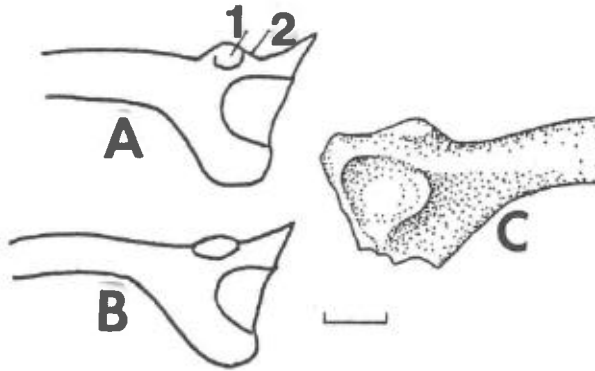


Fig. 1: Ilium of Modern and fossil *Hyla*. A. proximal left ilium of modern *Hyla meridionalis* (male), Museo Nacional Ciencias Naturales No. 16226. B. proximal left ilium of modern *Hyla arborea* (male), MNCN 16219. C. proximal right ilium of fossil *Hyla meridionalis* from the Late Pleistocene (Ipswichian Interglacial Age) of Itteringham, Norfolk, Cromer Museum Itt. No. 3. A and B are from camera lucida drawings, C is from Hallock et al. (1990). Structure 1 is the dorsal protuberance. Structure 2 is the dorsal prominence. The line equals 1 mm and applies to all figures.

Assuming that *Hyla meridionalis* and *Hyla arborea* were both restricted to areas south of the Pyrenees during the Wolstonian Glacial Age, Engelmann et al. (1987, p. 14) indicate an eastern route around the Pyrenees that both species could have utilized to have invaded southern France and thence into England during the Ipswichian Interglacial Age.

Oddly, considering present ranges, it would seem that *Hyla arborea* rather than *Hyla meridionalis* might have been more likely to have reached England during Pleistocene Interglacial Stages (compare map 34 with map 35 in Arnold and Burton, 1978).

*Hyla meridionalis* is the species with the most southern general distribution in Europe today to have invaded the British Isles during any of the Pleistocene Interglacial Ages. Moreover, the occurrence of *Hyla meridionalis* in England (along with *Rana "esculenta"* or *ridibunda* and *Emys orbicularis*) during the Last Interglacial Age (Ipswichian) would indicate a warmer climate than occurs in Norfolk today.

The only other *Hyla* remains that have been recorded from the British Pleistocene consists of a distal humerus from deposits at Cudmore Grove, Mersea Island, Essex, that represent the Last Interglacial Age (Hoxnian) of the Middle Pleistocene. Unfortunately, I was unable to discern any differences between the distal humeri of *Hyla arborea* and *Hyla meridionalis* so that a specific identification could not be made.

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## REFERENCES

- Arnold, E.E. and Burton, J.A. (1978). *A Field Guide to the Reptiles and Amphibians of Britain and Europe*. Collins, London.
- Chantell, C.J. (1964). Some Mio-Pliocene hylids from the Valentine Formation of Nebraska. *American Midland Naturalist* **72**, 211-225.
- Engelmann, W.E.F., Jurgen, G.R. and Obst, F.J. (1986). *Lurche und Kriechtiere Europas*. F. Enke Verlag, Stuttgart.
- Escriva, L.J.B. (1987). *La Guia de Incafo de los Anfibios y Reptiles de la Peninsula Iberica, Islas Baleares y Canarias*. Incafo S.A., Madrid.
- Frazer, D. (1983). *Reptiles and Amphibians in Britain*. Collins, London.
- Hallock, L.A., Holman, J.A. and Warren, M.R. (1990). Herpetofauna of the Ipswichian Interglacial Bed (Late Pleistocene) of the Itteringham Gravel Pit, Norfolk, England. *Journal of Herpetology* **24**, 33-39.