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Amendment of the Annex of the Agreement

Review of Species to be listed on the Annex to the Agreement
(Compiled by A.M. Hutson)



With reference to Resolution 3.7 (Doc.EUROBATS.MoP3.12.Rev.4), the attention of the Advisory Committee is drawn to the following matters, which may affect the Annex of bat species occurring in Europe to which the Agreement applies. The Advisory Committee may wish to propose amendments to the Annex at the next MoP. This updates similar documents produced for MoP5 (Doc.EUROBATS.MoP5.9, Inf.EUROBATS.MoP5.9, EUROBATS.MoP5.Record.Annex6).

EUROBATS.MoP5.Record.Annex6 presents a list of species revised in accordance with amendments adopted at MoP5 (Ljubljana, 2006).

This report represents the opinions of members of an 'Advisory Panel' established for the purpose of assessing potential changes to the Annex of species. The panel comprises Stéphane Aulagnier (France), Petr Benda (Czech Republic), Gabor Csorba (Hungary), Sergei Kruskop (Russian Federation) and Friederike Spitzenberger (Austria) and, and co-ordinated by Tony Hutson (UK). This panel has no 'official' nomenclatural status. As 'ex-officio', Peter Lina (chairman of EUROBATS Advisory Committee) and Andreas Streit (Secretariat to EUROBATS) are also circulated for information and comment.

Mammal Species of the World is regarded by the International Union for the Conservation of Nature and Natural Resources (IUCN) and CMS as the standard list of mammals (see UNEP/CMS/Recommendation 9.4). A revised (3rd) edition (with the bats compiled by Nancy Simmons of the American Museum of Natural History) was published in early 2006 (Simmons, 2005). It is recommended that unless there is overriding reason, the Agreement should (in line with the policy of IUCN, CMS and others) adopt at least the generic (and higher) classification proposed in this work, but may adopt changes to the species list as appropriate.

1. *Barbastella leucomelas* (Cretzschmar 1826) / *darjelingensis* (Hodgson, 1855)

Traditionally the genus has comprised two species, the Western barbastelle (*Barbastella barbastellus*) from most of Europe, plus records from Morocco and the Canary Islands, and the Eastern barbastelle (*Barbastella leucomelas*) occurring from Sinai (type locality), Eritrea and the Caucasus eastwards along the southern regions of the Palaearctic to China and Japan. The two species are sympatric in the Caucasus (and possibly Turkey). *B. leucomelas* has widely been considered to comprise a western subspecies, *B. l. leucomelas*, and an eastern subspecies, *B. l. darjelingensis* (type locality: Darjeeling, N.E. India). Horáček *et al.* (2000) reported difficulty in separating *B. barbastellus* from the western form of *B. leucomelas*, but found the eastern form of *B. leucomelas* to be very distinct. They suggested that the eastern form might be a separate species, *B. darjelingensis*, and the sister species to *B. barbastellus* (including *B. l. leucomelas*). In describing a new species of *Barbastellus* from China (*B. beijingensis*), Zhang *et al.* (2007) also found the eastern form, *darjelingensis*, as very distinct from *leucomelas* from Egypt, supported by molecular data, but withheld 'firm conclusions because of inadequate data'. Mayer *et al.* (2007) identify a distinct difference in the DNA of *B. leucomelas* from Sinai and central European *B. barbastellus*. Benda, Dietz *et al.* (2008) also recognise *B. darjelingensis* as distinct from *B. leucomelas*, which they restrict to Sinai and southern Israel (and Eritrea). Further, they recognise *B. darjelingensis* from specimens from Turkmenistan and Uzbekistan (as well as Kyrgyzstan and Tajikistan), and suggest that published data for Caucasus states (e.g. Azerbaijan) agrees with *B. darjelingensis*. Benda & Mlikovsky (2008) also recognised *B. darjelingensis* as a separate species, but without further discussion. The identification of *B. leucomelas* of the Caucasus region as *B. darjelingensis* is supported by examination of a specimen from Armenia (S. Kruskop pers.comm.) and from published data such as Rakhmatulina (2005).

In the Agreement area *B. darjelingensis* is recorded (as *B. leucomelas*) from Armenia, Azerbaijan, Russia (Kandaurov, 2008), and occurs in adjacent territories to south and east.

Recommendation: Replace the name *Barbastellus leucomelas* with *B. darjelingensis* in the list of species of the Annex.

2. *Eptesicus anatolicus* Felten, 1971 and *E. bottae* (Peters, 1869)

As reported in Inf.EUROBATS.MoP5.9, the European species assigned to *E. bottae* was under investigation. Hanák *et al.* (2001) suggested that the species in south-east

Europe (Greece [Rhodes] and Turkey) might be distinct from *E. bottae* (described from Yemen) and could be assigned to a separate species *E. anatolicus* (described from Turkey and sometimes regarded as a subspecies of *bottae*). Benda *et al.* (2006) expanded morphological reasons for separating the two species, which they found to occur sympatrically in the Middle East. Mayer *et al.* (2007) used DNA to show that the Greek material was sufficiently distinct from *innesi* (Lataste, 1887) described from Cairo and currently considered a subspecies of *E. bottae*, but they were unable to compare these with true *bottae*. Benda *et al.* (2007) further identified *anatolicus* as a separate species and occurring also in Cyprus. *E. bottae* is also recorded from Armenia and Azerbaijan (Benda *et al.*, 2006; Kandaurov, 2008), and possibly Georgia. This is probably the subspecies *E. b. ognevi*.

While the DNA evidence needs further investigation and probably a revision of the whole group (including its relationships to *isabellinus*) needs investigating further, there would seem to be sufficient evidence to support the proposal that the taxon occurring in Greece (Rhodes), Cyprus and coastal Turkey (to Iran) be regarded as a separate species, *E. anatolicus*. Meanwhile, the species recorded from the Caucasus remains as *E. bottae*, but needs confirmation.

Recommendation: Accept the addition of *E. anatolicus* Felten, 1971 to the list of species of the Annex.

3. *Eptesicus isabellinus* (Temminck, 1840)

In comparing the DNA of serotine bats in Iberia and elsewhere in Europe, Ibáñez *et al.* (2006) showed that the south Iberian samples represented a paler cryptic species distinct from *E. serotinus*, and which might agree with *Eptesicus isabellinus* (described from Libya and formerly regarded as a North African arid-zone subspecies of *serotinus*). Mayer *et al.* (2007) recognised *E. isabellinus* from Morocco as distinct at the species level from *E. serotinus*. Further investigations by Juste *et al.* (2009), Artyushin *et al.* (2009) and García-Mударra *et al.* (2009) support the finding that *isabellinus* is a species distinct from *serotinus* and occurs in southern Spain. The Spanish populations are genetically very close to the north Moroccan populations (and with some slight but clear distinction from samples from south Morocco). P. Benda (pers. comm.) has examined specimens from the type locality in Libya and finds these agree in both morphology and genetics with specimens from Morocco. It is worth noting that as long ago as 1904, Cabrera (1904) recognised *E. isabellinus* from Spain on the basis of the form of the tragus, colour and other details. Within the Agreement area, *E. isabellinus* occurs in southern Spain and is not sympatric with *E. serotinus*.

Recommendation: Accept the addition of *Eptesicus isabellinus* (Temminck, 1840) to the list of species of the Annex.

4. *Eptesicus lobatus* Zagorodniuk, 2009.

This new species was described on the basis of the presence of a (?keeled) post-calcarial lobe in material from eastern Ukraine. No significant morphometric characters could be found to separate it from *E. serotinus*. The author assumed that this population is the western extreme of a wider range. Elsewhere in Europe, the post-calcarial lobe of *E. serotinus* is rather variable, usually obvious, although not as well developed as in some other species, but sometimes quite inconspicuous. It is considered that this is not a good character upon which to base the recognition of a new species.

Recommendation: Until more substantive characters can be identified, *E. lobatus* should be regarded as a synonym of *E. serotinus*.

5. *Hypsugo savii* (Bonaparte, 1837)

On the basis of DNA analysis, Ibáñez *et al.* (2006) first identified three lineages within the species *Hypsugo savii*, including one lineage from southern Iberia, one lineage from western Europe and one from eastern Europe. Then, Mayer *et al.* (2007) proposed that, on the basis of DNA analysis, a specimen from Morocco was sufficiently different from European *H. savii* as to represent a separate species. They also suggested that animals from the Canary Islands were similarly different. They provisionally called this forms *Hypsugo cf. darwini* (Tomes, 1859), originally described from Las Palmas, Canary Islands, but long considered to be a synonym of *H. savii* (which was described from Italy). García-Mudarra *et al.* (2009) also found a major difference between Moroccan forms and most mainland forms, but they also found two samples of the Moroccan form agreeing with one of the forms in southern Iberia, which occurs in sympatry with the other local mainland form. Thus there may be at least two species within this group within the geographical scope of the Agreement. There appears to have been no direct comparison of the taxa from the Canary Islands and Morocco, despite the previous genetic study of Pestano *et al.* (2003) which confirms the difference between samples from Spain and the Canary Islands, so the application of the name *darwini* to the Moroccan (and Iberian) samples needs further examination.

Recommendation: Await further investigation of the whole species-group.

6. *Myotis nattereri* (Kuhl, 1817) and *Myotis escalerae* Cabrera, 1904

With DNA analysis, Ibáñez *et al.* (2006) suggest the separation of a form of *Myotis nattereri* in Iberia as a separate species, more closely related to *Myotis schaubi* from

northern Iran (and Armenia). It is said to be a cave-breeding species forming colonies of several hundred animals, whereas *M. nattereri* s.str. tends to form smaller colonies in trees. It is described as having a distinct strong fringe of hairs on the edge of the tail membrane, but this does not differentiate it from *M. nattereri*. They propose the name *Myotis escalerae* for this species on the basis of it being described from Valencia on the Spanish Mediterranean coast (Ibáñez & Fernandez, 1969), where only *M. escalerae* has been identified in the current studies (J. Juste, pers. comm.), and on priority. Further study by García-Mudarra *et al.* (2009) support the separation of this form as a species (and identify other specimens from Morocco). From genetic studies to date of more than 300 individuals, *M. nattereri* s.str. has not been found in Spain (J. Juste, pers. comm.), *M. escalerae* was subsequently recorded from nearby French Pyrenees (Evin *et al.*, 2009). Within the Agreement area the species is recorded from Spain and southern France.

Recommendation: Accept the addition of *Myotis escalerae* (Cabrera, 1904) to the list of species of the Annex.

7. Pipistrellus hanaki Hulva & Benda, 2004

Hulva & Benda *in* Benda *et al.* (2004) described *Pipistrellus hanaki* from Libya as a new species very closely related to *P. pygmaeus*. This was further discussed in Hulva *et al.* (2004). Later, Hulva *et al.* (2007) identified this species as a 'sister taxon' from Crete (Greece). Benda *et al.* (2008) described the Cretan form as a new subspecies, *P. h. creticus*, on the basis of morphology and genetics, and include ecological and echolocation call data.

Recommendation: Accept the addition of *Pipistrellus hanaki* Hulva & Benda, 2004 to the list of species of the Annex.

8. Other issues

Ibáñez *et al.* (2006), Mayer *et al.* (2007) and García-Mudarra *et al.* (2009) discuss a number of other potential cryptic species including a further species related to *M. nattereri* (from the mountains of northern Spain, southern France, Austria and northern Italy). They regard this as a good species but in the absence of any morphological or ecological characters, defer formal naming of it. This form has also been identified from the Central French Pyrenees (Evin *et al.* 2009). The same authors suggest possible separation of species within *Plecotus auritus*, *Pipistrellus pipistrellus* and *Pipistrellus kuhlii*.

Boston *et al.* (2008) identify two distinct lineages in the Irish population of *Nyctalus leisleri*, one of which is most closely related to *Nyctalus azoreum*.

The question of whether *Myotis oxygnathus* is a species separate from *Myotis blythii* remains contentious. If they are separate then the European taxon would be *M. oxygnathus*. A recent advocate for that separation is Bogdanowicz *et al.* (2009). As the matter is unsettled (see Berthier *et al.*, 2006; Evin *et al.*, 2008) we propose to retain the name *blythii* for the European fauna.

There is a growing body of opinion (e.g. Van den Bussche & Hooper, 2004; Miller-Butterworth *et al.*, 2007; Aulagnier, 2008) that would separate the Miniopterinae as a separate family, Miniopteridae, but for reasons given in the previous document (Inf.EUROBATS.MoP5.9) and here, notably the adoption, as far as possible, by IUCN and CMS of *Mammal Species of the World* (Simmons, 2005) as a standard for higher classification, it is proposed to retain it as a subfamily for the time being.

References:

Artyushin, I.V., Bannikova, A.A., Lebedev, V.S. & Kruskop, S.V. 2009. Mitochondrial DNA relationships among North Palaearctic *Eptesicus* (Vespertilionidae, Chiroptera) and past hybridization between Common serotine and Northern bat. *Zootaxa* 2262: 40-52.

Aulagnier, S. 2008. Enfin reconnue la quatrième famille de Chiroptères en France ? *Symbioses*, n.s. 21: 1-6.

Benda, P., Andreas, M., Kock, D., Lucan, R.K., Minclinger, P., Nova, P., Obuch, J., Ochman, K., Reiter, A., Uhrin, M. & Weinfurtova, D. 2006. Bats (Mammalia: Chiroptera) of the Eastern Mediterranean. Part 4. Bat fauna of Syria: distribution, systematics, ecology. *Acta Societatis Zoologicae Bohemicae* 70: 1-329.

Benda, P., Dietz, C., Andreas, M., Hotovy, J., Lucan, R.K., Maltby, A., Meakin, K., Truscott, J. & Vallo, P. 2008. Bats (Mammalia: Chiroptera) of the Eastern Mediterranean and Middle East. Part 6, Bats of Sinai (Egypt) with some taxonomic, ecological and echolocation notes on that fauna. *Acta Societatis Zoologicae Bohemicae* 72: 1-103.

Benda, P., Georgiakakis, P., Dietz, C., Hanák, V., Galanaki, K., Markantonatou, V., Chudarkova, A., Hulva, P. & Horáček, I. 2008. Bats (Mammalia: Chiroptera) of the Eastern Mediterranean and Middle East. Part 7. The bat fauna of Crete, Greece. *Acta Societatis Zoologicae Bohemicae* 72: 105-190.

Benda, P., Hanák, V., Horáček, I., Hulva, P., Lucan, R. & Ruedi, M. 2007. Bats (Mammalia: Chiroptera) of the Eastern Mediterranean. Part 5. Bat fauna of Cyprus: review of records with confirmation of six species new for the island and description of a new subspecies. *Acta Societatis Zoologicae Bohemicae* 71: 71-130.

Benda, P., Hulva, P. & Gaisler, J. 2004. Systematic status of African populations of *Pipistrellus pipistrellus* complex (Chiroptera: Vespertilionidae), with a description of a new species from Cyrenaica, Libya. *Acta Chiropterologica* 6: 193-217.

Benda, P. & Mlikovsky, J. 2008. Nomenclatural notes on the Asian forms of *Barbastella* bats (Chiroptera: Vespertilionidae). *Lynx*, n.s. 39(1): 31-46.

- Berthier, P., Excoffier, L. & Ruedi, M. 2006. Recurrent replacement of mtDNA and cryptic hybridization between two sibling bat species *Myotis myotis* and *Myotis blythii*. *Proceedings of the Royal Society of London, Serie B*, 273(1605): 3101-3109.
- Bogdanowicz, W., Van den Bussche, R.A., Gajewska, M., Postawa, T. & Harutyunyan, M. 2009. Ancient and contemporary DNA sheds light on the history of mouse-eared bats in Europe and the Caucasus. *Acta Chiropterologica* 11(2): 289-305.
- Boston, E.S.M., Montgomery, I. & Prodohl, P.A. 2008. Mitochondrial phylogeography of the Leisler's bat, *Nyctalus leisleri*, in Ireland and across Europe: new perspectives. Pp. 32 in: *Abstracts of the XIth European Bat Research Symposium, Cluj-Napoca, Romania, 18th-22nd August 2008*. 180pp.
- Cabrera, A. 1904. Ensayo monográfico sobre los quirópteros de España. *Memorias de la Real Sociedad Española de Historia Natural* 2, 249-287.
- Evin, H., Lecoq, V., Durand, M.O., Tillon, L. & Pons, J.M. 2009. A new species for the French bat list: *Myotis escalerae* (Chiroptera: Vespertilionidae). *Mammalia* 73(2): 142-144.
- Evin, A., Baylac, M., Ruedi, M., Mucceda, M. & Pons, J.M. 2008. Taxonomy, skull diversity and evolution in a species complex of *Myotis* (Chiroptera : Vespertilionidae) : a geometric morphometric appraisal. *Biological Journal of the Linnean Society*, 95(3) : 529-538.
- García-Mударra, J.L., Ibáñez, C. & Juste, J. 2009. The Straits of Gibraltar: barrier or bridge to Ibero-Moroccan bat diversity. *Biological Journal of the Linnean Society* 96(2): 434-450.
- Hanák, V., Benda, P., Ruedi, M., Horáček, I. & Sofianidou, T.S. 2001. Bats (Mammalia: Chiroptera) of the Eastern Mediterranean. Part 2. New records and review of distribution of bats in Greece. *Acta Societatis Zoologicae Bohemicae* 65: 279-346.
- Horáček, I., Hanák, V & Gaisler, J. 2000. Bats of the Palaearctic Region: a taxonomic and biogeographical review. Pp. 11-157 in: Woloszyn, B.W. (ed.), *Proceedings of the VIIIth EBRS. Vol. 1, Approaches to Biogeography and Ecology of Bats*. Institute of Systematics and Evolution of Animals PAS in Krakow, Krakow. 273pp.
- Hulva, P., Benda, P., Hanák, V., Evin, A. & Horacek, I. 2007. New mitochondrial lineages within the *Pipistrellus pipistrellus* complex from Mediterranean Europe. *Folia Zoologica* 56(4): 378–388.
- Hulva, P., Horáček, I., Strelkov, P. P. & Benda, P. 2004. Molecular architecture of *Pipistrellus pipistrellus* / *Pipistrellus pygmaeus* complex (Chiroptera: Vespertilionidae): further cryptic species and Mediterranean origin of the divergence. *Molecular Phylogenetics and Evolution* 32(3): 1023–1035.
- Ibáñez, C. & Fernandez, R. 1989. Catálogo de los murciélagos de las colecciones del Museo Nacional de Ciencias Naturales. CSIC, Madrid. 56pp.
- Ibáñez, C., García-Mударra, J.L., Ruedi, M., Stadelmann, B. & Juste, J. 2006. The Iberian contribution to cryptic diversity in European bats. *Acta Chiropterologica* 8(2): 277-297.
- Juste, J., Bilgin, R, Muñoz, J. & Ibáñez, C. 2009. Mitochondrial DNA signatures at different spatial scales: from the effects of the Straits of Gibraltar to population structure in the meridional serotine bat (*Eptesicus isabellinus*). *Heredity* 103(2): 178-187.
- Kandaurov A. (Ed) 2008. *Bats Conservation Action Plan for the Caucasus*, Universal, Tbilisi. 88pp.

- Mayer, F., Dietz, C. & Kiefer, A. 2007. Molecular species identification boosts bat diversity. *Frontiers in Zoology* 4: 4 [5pp + additional material].
- Miller-Butterworth, C.M., Murphy, W.J., O'Brien, S.J., Jacobs, D.S., Springer, M.S. & Teeling, E. 2007. A family matter: conclusive resolution of the taxonomic position of the long-fingered bats, *Miniopterus*. *Molecular Biology and Evolution* 24(7): 1553-1561.
- Pestano, J., Brown, R.P., Suárez, N.M. & Fajardo, S. 2003. Phylogeography of pipistrelle-like bats within the Canary Islands, based on mtDNA sequences. *Molecular Phylogenetics and Evolution* 26(1): 56-63.
- Rakhmatulina, I. 2005. *Bats of Azerbaijan (Fauna, Ecology, Zoogeography)*. CBs Polygraphic Production, Baku. 476pp.
- Simmons, N.B. 2005. Order Chiroptera. Pp 312-529 in: Wilson, D.E. & Reeder, D.M. (Eds), *Mammal Species of the World; A Taxonomic and Geographical Reference (third edition)*. The John Hopkins University Press, Baltimore. 2142pp.
- Van den Bussche, R.A. & Hofer, S.R. 2004. Phylogenetic relationships among recent Chiropteran families and the importance of choosing appropriate out-group taxa. *Journal of Mammalogy* 85(2): 321-330.
- Zagorodniuk, I. 2009. Morphology of post-calcarial lobe in bats and its variation in *Eptesicus "serotinus"* (Mammalia). *Visnyk of Lviv University biological Series* 51: 157-175.
- Zhang, J.S., Han, N.J., Jones, G., Lin, L.K., Zhang, J.P., Zhu, G.J., Huang, D.W. & Zhang, S.Y. 2007. A new species of *Barbastella* (Chiroptera: Vespertilionidae) from North China. *Journal of Mammalogy* 88(6): 1393-1403.