

**Auchenorrhyncha communities in the Benninger Ried (S. Germany),  
a spring area with a remarkable relictary vegetation**

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The Benninger Ried is a calcarean spring fen with an extension of approximately 20 hectares southeast of the town of Memmingen in Bavaria (District Schwaben). It is the relic of a formerly vast fen area covering a great part of the dry valley of Memmingen. The nowadays protected natural reserve is characterized by open reed areas with *Schoenus nigricans* L. or *Cladium mariscus* (L.) Pohl, in addition many other Poaceae and Cyperaceae like *Molinia caerulea* (L.) Moench, *Sesleria albicans* Kit. and many species of *Carex*. These open areas, crossed by many brooks and rills draining the abundant water of the springs, harbour also the last populations of the Plumbaginaceae species *Armeria purpurea* (Koch), today obviously extinct in all its other former habitats. Apart from these reed areas, there are some other biotopes with different plant assemblages: extensively cultivated wet or moist meadows, reed of *Phragmites australis* (Cav.), copse consisting of several *Salix* species, birches (*Betula pubescens* Ehrh.) or alders (*Alnus glutinosa* (L.) Gaertn.) and, finally, mixed deciduous and coniferous wood. As a result of massive human interference, the extension of the area was not only extremely reduced, but by means of a system of draining ditches south of the reserve the remaining fen was also deprived of the original hydrological preconditions once essential for the formation of this ecosystem.

The survey concerning the fauna of cicadas extended over three years and furnished results, which underline the extraordinary importance of the reserve. On the whole, there were found 175 species, among them no less than 46 delphacid species, further 3 cixiid, 1 membracid, 5 aphrophorid and 120 cicadellid species. Accordingly to the Red Data Book of the German Auchenorrhyncha (Remane et al., 1998), 3 species belong to category 1 (Critically endangered) (*Chloriona stenoptera* (Fl.), *Megamelodes lesquesnei* W.Wg., *Xanthodelphax xanthus* Vilb.), 14 species to category 2 (Endangered) (*Kelisia guttulifera* (Kbm.), *K. praecox* Hpt., *K. sima* Rib., *Ditropsis flavipes* (Sign.), *Megamelodes quadrimaculatus* (Sign.), *Delphacodes capnodes* (Scott), *Clorionidea flava* P.Löw, *Florodelphax paryphasma* (Fl.), *Paradelphacodes paludosus* (Fl.), *Macropsis haupti* W.Wg., *Edwardsiana alnicola* (Edw.),

*Sorhoanus schmidti* (W.Wg.), *Cosmotettix caudatus* (Fl.), *Cosmotettix costalis* (Fall.), 16 species to category 3 (Vulnerable) (*Cixius distinguendus* Kbm., *C. similis* Kbm., *Kelisia irregulata* Hpt., *K. pallidula* (Boh.), *K. ribauti* W.Wg., *Euconomelus lepidus* (Boh.), *Delphax crassicornis* (Panz.), *D. pulchellus* (Curt.), *Paraliburnia adela* (Fl.), *Acanthodelphax denticauda* (Boh.), *Idiocerus herrichii* Kbm., *Edwardsiana gratiosa* (Boh.), *Linnavuoriana decempunctata* (Fall.), *Macrosteles frontalis* (Scott), *M. ossiannilssoni* Ldb., *Cicadula saturata* (Edw.), 6 species to category R (Rare) (*Javesella stali* (Metc.), *Empoasca apicalis* (Fl.), *Edwardsiana soror* (Lnv.), *Edwardsiana* cfr. *ampliata* (W.Wg.), *Balclutha saltuella* (Kbm.), *Cicadula rubroflava* Lnv.), 2 species to category D (Data deficient) (*Muellerianella fairmairei* (Perris), *Edwardsiana lethierryi* (Edw.)) and 12 species to category V (Near threatened) (*Stenocranus fuscovittatus* (Stål), *Euides speciosa* (Boh.), *Delphacodes venosus* (Germ.), *Muellerianella extrusa* (Scott), *Florodelphax leptosoma* (Fl.), *Struebingianella lugubrina* (Boh.), *Stroggylocephalus agrestis* (Fall.), *Empoasca affinis* Nast, *Cicadula flori* (J.Shlb.), *C. frontalis* (H.-S.), *Jassargus sursumflexus* (Then), *Sorhoanus assimilis* (Fall.)). *Megamelodes lequesnei* and *Muellerianella fairmairei* are new records for Bavaria. The fact that *Megamelodes lequesnei*, *Xanthodelphax xanthus* and *Chloriona stenoptera* live in the Benninger Ried in notably rich populations and at many different sites, may imply that the fen offers ideal conditions to those generally quite rare species.

Among the different vegetation types within the reserve, the extensively cultivated humid meadows proved to be particularly rich of cicada species, but the *Schoenus* reed and the woods in the eastern part of the reserve furnished remarkable results as well. Interestingly, in particular the marginal areas with the characteristics of transition-biotopes present the most manifold associations of cicadas.

In order to maintain this diversity, in the first place it is important to avoid any additional worsening of the hydrological conditions. Moreover, the expansion of shrub areas and wood into both reed areas and humid meadows has to be checked. The meadows are to be mowed at most every two years. On the other hand, trees and shrubs have a substantial importance as particular biotopes, but above all by offering both retreat areas during hibernating or extreme weather conditions and shelter from direct sunlight and harsh wind. On the whole, it is to take care to warrant the greatest possible diversity of biotopes with their diverse small-range structures and gradients concerning temperature, shadow and humidity.

**Reference**

- Remane, R., R. Achtziger, W. Fröhlich, H. Nickel & W. Witsack.** 1998. Rote Liste der Zikaden (Homoptera, Auchenorrhyncha). - *In*: Binot, M., R. Bless, P. Boye, H. Gruttke & P. Pretscher (eds.). Rote Liste gefährdeter Tiere Deutschlands. *Schriftenreihe Landschaftspflege und Naturschutz*, 55: 243-249.

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## ABSTRACTS



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