EUROPEAN NATURAL HERITAGE: THE SAPROXYLIC BEETLES IN THE PROPOSED PARCUL NATIONAL DEFILEUL JIULUI

PATRIMONIUL NATURAL EUROPEAN: COLEOPTERE SAPROXILICE DIN PARCUL NAȚIONAL PROPUS DEFILEUL JIULUI

HEINZ BUSSLER, JORG MÜLLER, VOLKER DORKA

Bayerische Landesanstalt fur Wald und Forstwirtschaft (LWF)

Abstract

In 2004 the saproxylic beetles fauna was investigated in the proposed National Park Defileul Jiului. 115 saproxylic beetles were found in the area. Amongst them seven are listed in Appendix II of the Fauna-Flora-Habitat Directive (92/43/EWG) : *Rhysodes sulcatus* (F.,1787), *Cucujus cinnaberinus* (SCOP.,1763), *Osmoderma eremita* (SCOP.,1763), *Lucanus cervus* (L.,1758), *Cerambyx cerdo* L.,1758, *Rosalia alpina* (L.,1758) and *Morimus funereus* MULS.,1863. *Osmoderma eremita* and *Rosalia alpina* are further priority species of the Directive. New records for Romanian fauna were *Eubrachium hispidulum* BREMI-WOLF, 1855 and *Metaclisa azurea* (WALTL,1839). Virgin forest relict species sensu stricto in the recorded spectrum are: *Rhysodes sulcatus* (F.,1787), *Omoglymmius germari* (GANGLB.,1892), Peltis grossa (L.,1758), Nematodes filum (F.,1801), Otho spondyloides (GERM.,1818), *Eurythyrea austriaca* (L.,1767), *Dicerca berolinensis* (HBST.,1779), *Bothrideres bipunctatus* (GMEL.,1790), *Mycetophagus decempunctatus* F.,1801, *Rhopalocerus rhondanii* (VILLA,1863), *Neomida haemorrhoidalis* (F.,1787), *Platydema dejeanii* CAST.BRULLE,1831, Diaclina testudinea (PILL.MITT.,1783), Neatus picipes (HBST.,1797), *Metaclisa azurea* (WALTL,1839), *Tenebrio opacus* DUFT.,1812, *Menephilus cylindricus* (HBST.,1784), *Osmoderma eremita* (SCOP.,1763) and *Cerambyx cerdo* L.,1758. The sampling of saproxylic species in the proposed National Park indicates a unique fauna relict of Europe-wide importance. It is expected that this area is home to the complete saproxylic beetle fauna of the natural forest communities of this region. The Romanian and probably the Ukrainian beech forests are the last real reference sites for complete wood beetle communities of the temperate central European forest communities.

Keywords:Proposed National Park Defileul Jiului, saproxylic beetles, native forest, virgin forest relict species, species listed in Appendix II of Fauna-Flora-Habitat Directive, unique fauna relict of Europe-wide importance

Rezumat

In anul 2004 în Parcul Național propus Defileul Jiului a fost cercetată fauna de coleoptere saproxilice. Au fost găsite 115 specii de coleoptere saproxilice. Dintre acestea, şapte sunt enumerate în Anexa II din Directiva Faună-Floră-Habitate (92/43/EWG) : *Rhysodes sulcatus* (F.,1787), *Cucujus cinnaberinus* (SCOP.,1763), *Osmoderma eremita* (SCOP.,1763), *Lucanus cervus* (L.,1758), *Cerambyx cerdo* L.,1758, *Rosalia alpina* (L.,1758) şi *Morimus funereus* MULS.,1863. *Osmoderma eremita* şi *Rosalia alpina* sunt alte două specii prioritare ale Directivei. Noi înregistrări pentru fauna română au fost: *Eubrachium hispidulum* BREMI-WOLF, 1855 and *Metaclisa azurea* (WALTL,1839). Specii relictare ale pădurii virgine sensu stricto în spectrul înregistrat sunt: *Rhysodes sulcatus (*F.,1787), *Omoglymmius germari* (GANGLB.,1892), *Peltis grossa* (L.,1758), *Nematodes filum* (F.,1801), *Otho spondyloides* (GERM.,1818), *Eurythyrea austriaca* (L.,1767), *Dicerca berolinensis* (HBST.,1779), *Bothrideres bipunctatus* (GMEL.,1790), *Mycetophagus decempunctatus* F.,1801, *Rhopalocerus rhondanii* (VILLA,1863), *Neomida haemorrhoidalis* (F.,1787), *Platydema dejeanii* CAST.BRULLE,1831, *Diaclina testudinea* (PILL.MITT.,1783), *Neatus picipes* (HBST.,1797), *Metaclisa azurea* (WALTL,1839), *Tenebrio opacus* DUFT.,1812, *Menephilus cylindricus* (HBST.,1784), *Osmoderma eremita* (SCOP.,1763) şi *Cerambyx cerdo* L.,1758. Prelevarea de eşantioane de specii saproxilice în Parcul Național propus indică o faună relictară unică, de importanță europeană. Se deduce că aceast areal este locuit de întreaga faună de coleoptere saproxilice a comunităților silvice naturale ale acestei regiuni. Pădurile de fag din România şi probabil şi cele din Ucraina sunt ultima referință reală pentru comunități complete de coleoptere xilobionte ale comunităților silvice din zona temperată central-europeană.

Cuvinte cheie: Parcul Național propus Defileul Jiului, coleoptere saproxilice, pădure nativă, specii relicte ale pădurii virgine, specii enumerate în Anexa II a Directivei Floră-Faună-Habitate, relicvă faunistică unică de importanță europeană.

1. INTRODUCTION

Wood was an all-present organic substrate in the natural conditions of virgin forests of the European region. In this context it becomes understandable that roughly one fourth (app. 2000 species) of all documented beetle species in Europe are adapted to this habitat. Because of the rich structure and the variety of stages of decomposition, wood provides a large number of ecological niches for a wide spectrum of life-forms (wood- and bark-feeders, saproxylic fungi colonists and fungal hyphae feeders, sap suckers and cavity species, tree humus living species and highly adapted predators, etc). Beetles play a dominant role in both the natural decomposition of dead wood and the creation of secondary structures (e.g. larval gallery, tree humus). They prepare the substrate for colonisation by other species (e.g. hymenoptera) and, because of their high degree of specialisation and often specific colonisation sequences, contribute significantly to the complex ecological interrelationships of deadwood-rich forests.

Their differentiated lifestyles, their high species numbers and their sensitivity to changes in their habitat make saproxylic beetles an indicator group in nature conservation and landscape planning. Characteristic beetle communities (virgin forest relict species, stenotope species) are used to assess the condition, ecological maturity, ecological continuity, and naturalness of forests, parks, woodland fringes, orchards,

hedges, etc. Mapping of habitat structures, target species and specific communities can contribute to the formulation and implementation of landscape ecology objectives for habitat management and act as a baseline for maintenance and development concepts.

2. METHODS

A number of methods are accepted for the collection of saproxylic beetles and each of them produces different capture results with regards to the species spectrum. The sampling methods should ideally be used in combination and spread temporally throughout the season in order to capture the best possible representation of the species spectrum (BUSSLER ET AL. 2004). However experience shows that an almost complete acquisition of the saproxylic fauna of an area (as with other fauna) is possible only through continued collection over years.

The following methods were used for the collection of saproxylic beetles in the area of the Jiu-flume:

* HAND CAPTURE: The animals are captured by manually searching woody structures. Chisels and knives are usually used as sampling aids for breaking up bark and opening breeding chambers. Exhausters enable the collection of very small species.
* BEATING TRAY: By tapping on dead or living tree parts or flowering bushes with a stick, the animals are knocked off onto a white fabric shield that is held below. This allows for the fast and effective recognition and collection of small individuals.
* SWEEP NETTING: Many saproxylic beetles are temporarily in the groundcover or visit specific flower types (for the capture of pollen, as rendezvous places, etc). The netting of such vegetation is especially effective in the midday sun, on sweltering days and especially along woody vegetation.
* SIFTING TREE HUMUS: Tree humus and manually chopped highly decomposed wood sections are roughly sifted. The remaining material is spread onto a white sheet and searched for beetles, larvae and fragments. It is recommended that part of the collected material is taken and further investigated at home for tiny species (Berlese-Apparatus, etc.). As tree humus is a deficient substrate in most woody vegetation, it is necessary for the discarded sample material to be put back into the tree.
* NIGHT ILLUMINATION OF STEMS: Many beetle species, amongst them many of the valuable humus living species, are nocturnal and leave the wood only in the dawn. The illumination of old trees in the dawn or in the first hours of the night with a headlamp or torch is very effective. Some volant species also fly to stationary illumination points like moths.
* BREEDING: Species with short flying times or very secretive life styles can be easily bred and verified by collecting and isolating wood or wood fungi with established larvae.

3. STUDY AREA

The studies were carried out within the area administered by the Targu Jiu Forest Authority in the region of the Jiu-flume from 305 m a.s.l. to the tree line at roughly 1500 m a.s.l. The coordinates of the capture sites were recorded with a 12 channel Garmin eTrex GPS (Global Positioning System) in degrees, minutes, seconds using the map datum "Potsdam (PD)".

Table 1 : Study Sites
Locul cercetărilor

No. 1: Timber yard and windfall area at the end of forest road Bratcu, 1,2 km NNW "in berd's flight" of Bumbesti-Jiu - i.b.f. of B.-J. (N 45°16.20 - EO 23°20.09), 840 m a.s.l, 6.8.2004, 10.8.2004, 11.8.2004, 12.8.2004.

No. 2: "The Little Domogled" (Fig.1), 9,5 km NNW i.b.f. of B.-J., (N 45°15.51 - EO 23°20.25), 6.8.2004, 735 - 750 m a.s.l.

Fig.1."The Little Domogled", Bumbesti-Jiu Forest District, Product Unites III, parcels 54 -55.
"Micul Domogled", Ocolul Silvic Bumbeşti-Jiu, UP III, parcelele 54 -55. (Foto: H. Bussler)

No. 3: Pine stand at Monastery Visina's ruins, 1,9 km NNE i.b.f. of B.-J. (N 45°11.34 - EO 23°23.41), 340 m a.s.l 7.8.2004, 12.8.2004.

No. 4: Old beech on Jiu bank, 0,9 km NNW i.b.f. of Monastery Lainici and 10,1 km N i.b.f. of B.-J. (N 45°16.11 - EO 23°23.31), 447 m a.s.l., 7.8.2004.

No. 5: "Cârligul Întors", fire scar at railway bridge, 11,5 km N i.b.f. of B.-J. (N 45°16.42 - EO 23°23.28), 475 m a.s.l., 7.8.2004.

No. 6: Mixed durmast with azonal pine stand between Monasteries Visina and

Lainici, 5,3 - 5,8 km NNW i.b.f. of B.-J. (N 45°13.21 - EO 23°23.03 und N 45°13.30 - EO 23°23.02), 350 - 400 m a.s.l., 9.8.2004.

No. 7: Poplar floodplain meadow with mine shaft, 0,8 km NW i.b.f. of B.-J. no record, 305 m a.s.l., 12.8.2004.

No. 10: Transmitter station with timber yard, 2,5 km NNE of Monastery Lainici and 11,8 km N i.b.f. of B.-J (N 45°15.58 - EO 23°24.03), 620 m a.s.l., 9.8.2004.

No. 12: Chenia-Dumitra Meadows of Vâlcan Mountains, 14,8 km NNW i.b.f. of B.-J (N 45°18.16 - EO 23°25.13), 1450 m a.s.l., 11.8.2004.

The following study location lies outside of the boundaries of the proposed national park. The grazed forest around Tismana is extremely valuable in terms of both nature conservation and scenic beauty. The majority of the species found only at this site to date are also certain to occur in the oak belt of the proposed national park. The possibility of designating the grazed forest as a biosphere reserve or nature reserve prior to the declaration of the national park should be evaluated.

Hu: "Dumbrava", grazed oak forest at Tismana (Fig. 2), 35,5 km SW i.b.f. of B.-J. (N 45°03.31 - EO 23°01.26), 260 - 270 m a.s.l., 6.8.2004, 8.8.2004.

Fig. 2. "Dumbrava - Trupul Cracul Manilor", grazed oak forest at Tismana, Forest District Tismana, Product Unit VI, parcels 95-96.
"Dumbrava - Trupul Cracul Manilor", pădure de stejar pășunată, Ocolul Silvic Tismana, UP VI, u.a. 95-96 (Foto: J. Müller)

4. RESULTS

Between 6.8 and 12.8.2004 the saproxylic beetles of the area could be captured only through spot sampling. A total number of more than 500 saproxylic beetle species can be assumed. The nomenclature is based on KÖHLER & KLAUSNITZER 1998.

Table 2 : Saproxylic beetles in the proposed Defileul Jiului National Park
Coleoptere saproxilice din propusul Parc National Defileul Jiului

FFH-Appendix II* = priority species of the Fauna - Flora - Habitat - Directive - RL 92/43/EWG from. 21.05.1992.
= specie prioritară din Directiva Faună-Floră -Habitat - RL 92/43/EWG from. 21.05.1992.

FAM. CARABIDAE	
Tachyta nana (GYLL.,1810)	No. 1
FAM. RHYSODIDAE	
***Rhysodes sulcatus* (F.,1787)** (Fig. 3)	No. 6 Virgin forest relict species **FFH-Appendix II**

Fig. 3. *Rhysodes sulcatus* F. (Foto: H. Bussler)

Omoglymmius germari (GANGLB.,1892)	No. 4 Virgin forest relict species
FAM. HISTERIDAE	
Platylomalus complanatus (PANZ.,1797)	Hu, No. 1
Paromalus flavicornis (HBST.,1792)	Hu
*Epierus comptus (*ER.,1807)	Hu
Epierus italicus (PAYK.,1811)	Hu
Eubrachium hispidulum BREMI-WOLF, 1855	Hu New for Romania
FAM. STAPHYLINIDAE	
Scaphidium quadrimaculatum OL.,1790	No. 2, 6
Siagonum quadricorne KIRBY,1815	No. 1

Carphacis striatus (OL.,1794)	No. 1, 12	
Sepedophilus bipunctatus (GRAV.,1802)	Hu	
FAM. CLERIDAE		
Tillus elongatus (L.,1758)	No. 1	
FAM. TROGOSITIDAE		
Tenebroides fuscus (GOEZE,1777)	Hu, No. 1, 5	
FAM. PELTIDAE		
***Peltis grossa* (L.,1758) (Fig. 4)**	No. 1, 2, 5	Virgin forest relict species

Fig. 4. *Peltis grossa* L. (Foto: H. Bussler)

FAM. ELATERIDAE		
Ampedus cinnabarinus (ESCHZ.,1829)	No. 4	
Ampedus rufipennis (STEPH.,1830)	No. 4, 7	
Ampedus sanguineus (ESCHZ.,1829)	No. 3	
Elater ferrugineus L.,1758	No. 4	
Stenagostus rhombeus (OL.,1790)	No. 6	
FAM. EUCNEMIDAE		
Farsus dubius (PILL.MITT.,1783)	Hu, No. 7	
Nematodes filum (F.,1801)	No. 6	Virgin forest relict species
Hylis olexai PALM,1955	No. 1	
Otho spondyloides (GERM.,1818)	No. 6	Virgin forest relict species
FAM. BUPRESTIDAE		
Acmaeoderella flavofasciata (PILL.MITT.,1783)	No. 5	
Dicerca berolinensis (HBST.,1779)	Hu	Virgin forest relict species
Scintillatrix rutilans (F.,1777)	No. 6	
Eurythyrea austriaca (L.,1767)	No. 1, 2	Virgin forest relict species
Buprestis haemorrhoidalis HBST.,1780	No. 3	
Buprestis octoguttata L.,1758	No. 3	
Phaenops cyanea (F.,1775)	No. 3	
Anthaxia fulgurans (SCHRK.,1789)	No. 2	
Anthaxia podolica MANNH.,1837	No. 2	
Chrysobothris affinis (F.,1794)	No. 1, 10	

Chrysobothris igniventris RTT.,1895	No. 3	
Agrilus viridis (L.,1758)	No. 10	
FAM. BOTHRIDERIDAE		
Bothrideres bipunctatus (GMEL.,1790)	Hu, No. 7	Virgin forest relict species
FAM. CERYLONIDAE		
Cerylon histeroides (F.,1792)	No. 1, 5	
Cerylon ferrugineum STEPH.,1830	Hu, No. 5, 6	
FAM. NITIDULIDAE		
Ipidia binotata RTT.,1875	No. 1	
Cyllodes ater (HBST.,1792)	No. 1, 5, 6	
Cychramus luteus (F.,1787)	No. 1, 5, 6	
FAM.CUCUJIDAE		
C*ucujus cinnaberinus* (SCOP.,1763)	No. 4, 5, 6	**FFH-Appendix II**
FAM. SILVANIDAE		
Silvanus unidentatus (F.,1792)	No. 1	
Uleiota planata (L.,1761)	Hu, No. 1, 12	
FAM. EROTYLIDAE		
Tritoma bipustulata F.,1775	No. 1	
Triplax aenea (SCHALL.,1783)	No. 1, 5, 6	
Triplax russica (L.,1758)	No. 1, 5, 6	
Tripla scutellaris CHARP.,1825	No. 1, 12	
Triplax rufipes (F.,1775)	No. 1, 5, 6	
Dacne bipustulata (THUNB.,1781)	No. 1	
FAM. MYCETOPHAGIDAE		
Triphyllus bicolor (F.,1792)	No. 1	
Litargus connexus (FOURCR.,1785)	No. 5	
Mycetophagus quadripustulatus (L.,1761)	No. 1, 5, 6, 12	
Mycetophagus piceus (F.,1792)	No. 5	
M*ycetophagus decempunctatus* F.,1801	No. 1	Virgin forest relict species
Mycetophagus multipunctatus F.,1792	No. 1	
Mycetophagus atomarius (F.,1792)	No. 1	
FAM. COLYDIIDAE		
Rhopalocerus rhondanii (VILLA,1863)	No. 4	Virgin forest relict species
Bitoma crenata (F.,1775)	Hu, No. 1, 2, 12	
Colydium elongatum (F.,1787)	Hu	
FAM. ENDOMYCHIDAE		
Endomychus coccineus (L.,1758)	No. 1, 2, 6	
Endomychus thoracicus (CHARP.,1825)	No. 6	
FAM. ANOBIIDAE		
Ptilinus pectinicornis (L.,1758)	No. 1, 12	
FAM. SALPINGIDAE		
Salpingus planirostris (F.,1787)	No. 1	

FAM. PYROCHROIDAE		
Pyrochroa coccinea (L.,1761)	No. 1	
FAM. MELANDRYIDAE		
Eustrophus dermestoides (F.,1792)	Hu	
Anisoxya fuscula (ILL.,1798)	No. 1, 6	
Abdera quadrifasciata (CURT.,1827)	No. 6	
Phloiotrya vaudoueri MULS.,1856	Hu, No. 6	
FAM. ALLECULIDAE		
Prionychus melanarius (GERM.,1813)	Hu	
Mycetochara roubali MARAN,1935	No. 5	
FAM. TENEBRIONIDAE		
Diaperis boleti (L.,1758)	Hu, No. 5	
Bolitophagus reticulatus (L.,1767)	No. 1, 6	
Neomida haemorrhoidalis (F.,1787)	No. 1, 6	Virgin forest relict species
Platydema violacea (F.,1790)	No. 6	
Platydema dejeanii CAST.BRULLE,1831	No. 5, 6	Virgin forest relict species
Corticeus unicolor (PILL.MITT.,1783)	No. 1, 6	
Diaclina testudinea (PILL.MITT.,1783)	Hu	Virgin forest relict species
Uloma culinaris (L.,1758)	Hu, No. 5	
Uloma rufa PILL.MITT.,1783)	No. 3	Virgin forest relict species
Tenebrio opacus DUFT.,1812	No. 6	Virgin forest relict species
Enoplopus velikensis (PILL.MITT.,1783)	Hu, No. 2, 4, 5, 6	
Helops coeruleus (L.,1758)	No. 5	
Neatus picipes (HBST.,1797)	Hu	Virgin forest relict species
Menephilus cylindricus (HBST.,1784)	Hu, No. 3	Virgin forest relict species
***Metaclisa azurea* (Waltl,1839) (Fig. 5)**	Hu	New for Romania Virgin forest relict species

Fig. 5. *Metaclisa azurea* Waltl. (Foto: H. Bussler)

FAM. SCARABAEIDAE
Oryctes nasicornis (L.,1758) Hu
Protaetia aeruginosa (DRURY,1770) Hu
Protaetia angustata (GERM.,1817) Hu, No. 5
Cetonia aurata (L.,1761) No. 5
Osmoderma eremita* (SCOP.,1763) (Fig. 6)** Hu, No. 4 **FFH-Appendix II
Virgin forest relict species

Fig.6.*Osmoderma eremita* SCOP.(Foto: V. Dorka)

*Gnorimus nobilis (*L.,1758) No. 1
*Trichius fasciatus (*L.,1758) No. 1
Trichius sexualis BEDEL,1906 No. 1, 2
FAM. LUCANIDAE
***Lucanus cervus* (L.,1758)** Hu, No. 5, 6 **FFH-Appendix II**
Dorcus parallelipipedus (L.,1758) Hu, No. 1, 4, 5, 6
S*inodendron cylindricum* (L.,1758) Hu, No. 1, 6, 12
FAM. CERAMBYCIDAE
Prionus coriarius (L.,1758) No. 1, 5
*Arhopalus rusticus (*L.,1758) No. 3, 5
Rhagium mordax (GEER,1775) No. 1
Leptura quadrifasciata (L.,1758) No. 1
Leptura aurulenta (F.,1792) No. 1, 10
Leptura maculata (PODA,1761) No. 1, 2, 5
Corymbia fulva (DEG.,1775) No. 2
Corymbia rubra (L.,1758) No. 1, 2
Corymbia scutellata (F.,1781) No. 1
Anastrangalia dubia (SCOP.,1763) No. 1
Pachytodes cerambycifomis (SCHRK.,1781) No. 1, 2
Stenurella melanura (L.,1758) No. 1, 2
Stenurella bifasciata (MÜLL.,1776) No. 5
Stenurella septempunctata (F.,1792) No. 2
Cerambyx velutinus BRULLE,1832 Hu

***Cerambyx cerdo* L.,1758 (Fig. 7)** Hu, No. 6, 10 Virgin forest relict species
FFH Appendix II

Fig.7.*Cerambyx velutinus* L.
(Foto H. Bussler)

Cerambyx scopolii FUESSL.,1775 No. 1
*Stenopterus rufus (*L.,1767) No. 5
***Rosalia alpina* (L.,1758) (Fig. 8)** No. 1, 2, 5, 6, 10, 12
FFH Appendix II*

Fig. 8. *Rosalia alpina* L.
(Foto: H. Bussler)

Xylotrechus rusticus (L.,1758) No. 1, 10, 12
Xylotrechus antilope (SCHÖNH.,1817) No. 5, 6
C*hlorophorus varius* (MÜLL.,1766) No. 6

Morimus funereus MULS.,1863 (Fig. 9) No. 1, 4, 6, 10, 12
FFH-Appendix II

Fig.9. *Morimus funereus* Muls. (Foto: V. Dorka)

Monochamus sutor (L.,1758)	No. 2
Acanthoderes clavipes (SCHRK.,1781)	No. 1
Leiopus nebulosus (L.,1758)	No. 1
E*xocentrus lusitanus* (L.,1767)	No. 5
Saperda populnea (L.,1758)	No. 2
FAM. ANTHRIBIDAE	
Platyrhinus resinosus (SCOP.,1763)	No. 6, 12
*Anthribus albinus (*L.,1758)	No. 2
FAM. SCOLYTIDAE	
Taphrorychus bicolor (HBST.,1793)	No. 1
Xyleborus monographus (F.,1792)	Hu
FAM. CURCULIONIDAE	
Ruteria hypocrita BOH.,1837	No. 1, 6

5. ANNOTATIONS TO SELECTED SPECIES

***Rhysodes sulcatus* (F.,1787)**

This species has the highest demand on biotope tradition and original forests on a landscape level. Records are unknown in relict old forest stands in open landscapes (grazed forests, parks, etc.). It was verified by the authors in 1994 in Parcul National Valea Cernei in red beech, 1992 in Bialowiecza in Poland in ash and 2004 in Defileul

Jiului in roughly 30 cm of oak deadwood on the ground. The history of extinction of the species in west and middle Europe was documented by SPEIGHT 1989. Saproxylic insect species useful in identifying forests of international importance to nature conservation (SPEIGHT 1989).

***Omoglymmius germari* (GANGLB.,1892)**

In contrast to Rhysodes sulcatus this species seems to be associated more strongly to river valleys and floodplains. It was first found in 1997 south of Baile Herculane at the river Cerna near Toplet under the bark of a standing dead poplar. It was found in 2004 in high numbers on the banks of the Jiu north of Monastére Lainici in the rotten walls of a large tree humus hollow of an ancient red beech in which Osmoderma eremita was also found. Saproxylic insect species useful in identifying forests of international importance to nature conservation (SPEIGHT 1989).

***Peltis grossa* (L.,1758)**

This species was found in Romania on fir, red beech, and alder. Stable populations are unknown outside of closed forests. In Germany Peltis grossa is documented only for firwood in original alpine forests of the Alps. Saproxylic insect species useful in identifying forests of international importance to nature conservation (SPEIGHT 1989).

***Nematodes filum* (F.,1801)**

A species for which only single relict occurrences are known in Europe (HORION 1953). Proof on 9.8.2004 on red beech near Bumbesti-Jiu and 13.8.2004 at the bank of the Cerna northeast of Baile Herculane on alder. Already in 1940 Dorn reported "Herkulesbad" as a capture site of this virgin forest relict species.

***Otho spondyloides* (GERM.,1818)**

An east-European Siberian species that is documented for few relict sites as far west as Carinthia (HORION 1953). Two samples were found on 6.8.2004 on a recently fallen thick beech tree north of Bumbesti-Jiu in a gorge forest.

***Eurythyrea austriaca* (L.,1767)** (Fig. 10)

Jewel beetle species with a close bond to original mixed mountain forests. Isolated relict occurrences in Algeria on Abies numidica. Record in 2004 in Defileul Jiului on Abies alba.

Saproxylic insect species useful in identifying forests of international importance to nature conservation (SPEIGHT 1989).

Fig. 10. *Eurythyrea austriaca* L. (Foto: Heinz Bussler)

***Dicerca berolinensis* (HBST.,1779)**

Primary habitats are pristine alpine beech forests (HORION 1955) that are, at least partially, in a terminal and decaying phase. Here, sun-exposed deadwood forms in the tree crowns, and serves as development places. Evidence of typical exit holes on hornbeam in 2004 in grazed forests in Tismana (secondary habitat). Saproxylic insect species useful in identifying forests of international importance to nature conservation (SPEIGHT 1989).

***Bothrideres bipunctatus* (GMEL.,1790)**

A virgin forest relict with discontinuous east-west distribution and declining numbers. (HORION 1961). Both found in Parcul National Valea Cernei and in Defileul Jiului on red beech and Salix spp.

***Mycetophagus decempunctatus* F.,1801**

European species with main distribution in the east. Relict in original deciduous forests. Continuous decline in central Europe since the 20th century (HORION 1961). Four samples recorded 10.8.2004 north of Bumbesti Jiu on tree fungi on old red beech.

***Rhopalocerus rhondanii* (VILLA,1863)**

South Europe and southern central Europe with discontinuous east-west distribution. In the west only single isolated relict occurrences in France and Germany. The species lives under the bark and in the tree humus of old trees with ants of the genus Lasius. One species was found in association with Osmoderma eremita and Omoglymmius germari on 7.8.2004 north of Monastery Lainici in a humus hollow in an ancient beech on the bank of the river Jiu.

***Neomida haemorrhoidalis* (F.,1787)**

Development in tree fungi, especially on red beech. In the Carpathian Mountains also on various other fungi on deciduous and coniferous trees. A virgin forest relict species which seems to be declining in central Europe (HORION 1956). The species was found many times in 2004 north of Bumbesti Jiu in fungi-infested red beech.

***Platydema dejeanii* CAST.BRULLE,1831**

The species develops in fungi-infested deciduous trees. Only single isolated relict occurrences in central Europe. Records in the vicinity of Monastery Lainici on 7.8.2004 and 9.8.2004 in fungi-infested red beech.

***Diaclina testudinea* (PILL.MITT.,1783)**

Caspian fauna element that extends into southeastern central Europe (HORION 1956). Records 1996 on a dead poplar south of Baile Herculane at the river Cerna at Toplet and 2004 on old oaks in the grazed forests at Tismana.

***Neatus picipes* (HBST.,1797)**

A specialised species associated with specific structures and bound onto old tree humus hollows. Many populations in central Europe are already extinct (HORION 1956). It was also found in 2004 on old oaks in Tismana.

***Metaclisa azurea* (WALTL,1839)**

Also a Caspian fauna element whose distribution extended from Asia Minor to Hungary. In Hungary the species is threatened by extinction. The records from 2004 at Tismana are the first records of the species for Romania. Metaclisa azurea were found through nightly illumination of old oaks and woodpiles.

***Tenebrio opacus* DUFT.,1812**

The species lives in tree humus under the bark of old deciduous trees especially oaks, a few single findings on old beech (HORION 1956). The species is nocturnal and photophobic. At Bumbesti Jiu found on 9.8.2004 in an old red beech. In Parcul National Valea Cernei 1994 and 1996 also in tree humus in old red beech.

***Menephilus cylindricus (*HBST.,1784)**

A central European virgin forest relict species, extinct in Germany. Under decayed bark of coniferous trees, especially on pine, according to old documentations from the Banat, also found on old oaks (HORION 1956). 2004 north of Bumbesti Jiu on pine deadwood, in the grazed forest at Tismana in old oaks.

***Osmoderma eremita* (SCOP.,1763)**

Records are of the subspecies O. e. lassallei. Today the species is found mostly in secondary habitats and in the study area it was found in the grazed forests, but findings on an old red beech in the forest near the river show that primary occurrences can also be in closed forests.

***Cerambyx cerdo* L.,1758**

This virgin forest relict species could be verified by single individuals and a high density of burrows down to the base of the trunks of oaks in grazed forests, and associated with Cerambyx velutinus. The species was also found in the closed forests on oaks but in this case only higher up on the tree, likely in response to the temperature needs of the larvae.

6. EVALUATION AND DISCUSSION

Within the scope of the field studies from 6.8.2004 to 12.8.2004, 115 saproxylic beetles were found in the proposed area of the Difileul Jiului National Park. However a further 15 species were to date found only on the grazed oak forests at Tismana, but a large number of these are expected to be found in the durmast zone of the proposed national park.

Amongst the 115 saproxylic beetles in the proposed national park seven are listed in Appendix II of the Fauna-Flora Habitat Directive (92/43/EWG) : *Rhysodes sulcatus* (F.,1787), *Cucujus cinnaberinus* (SCOP.,1763), *Osmoderma eremita* (SCOP.,1763), *Lucanus cervus* (L.,1758), *Cerambyx cerdo* L.,1758, *Rosalia alpina* (L.,1758) and *Morimus funereus* MULS.,1863. *Osmoderma eremita* and *Rosalia alpina* are further priority species of the Directive. The species are widely distributed in these areas and occur to some extent in very high numbers (e.g. *Rosalia alpina*). Due to the

small scale habitat diversity in Defileul Jiului with the high variation of zonal and azonal forest communities, the FFH species are partially associated with each other in very small areas. For example, 6 of the 7 recorded FFH species could be observed at the study site No. 6 (vicinity Bumbeşti-Jiu - mixed durmast with azonal pine stand). It is assumed that there are occurrences of other FFH species such as *Limoniscus violaceus* (MÜLL.,1821) and *Phryganophilus ruficollis* (F.,1798). For the latter species old records exist from the Banat, Transylvania and the Transylvanian Alps (HORION 1956). New records for Romanian fauna were *Eubrachium hispidulum* BREMI-WOLF, 1855 and *Metaclisa azurea* (WALTL,1839). Virgin forest relict species are species that are linked to original forests and tree structures but because of the cultivation of forest landscapes, are reduced to relict areas (MÜLLER et al. 2005a). Virgin forest relict species sensu stricto in the recorded spectrum are: *Rhysodes sulcatus* (F.,1787), *Omoglymmius germari* (GANGLB.,1892), *Peltis grossa* (L.,1758), *Nematodes filum* (F.,1801), *Otho spondyloides* (GERM.,1818), *Eurythyrea austriaca* (L.,1767), *Dicerca berolinensis* (HBST.,1779), *Bothrideres bipunctatus* (GMEL.,1790), *Mycetophagus decempunctatus* F.,1801, *Rhopalocerus rhondanii* (VILLA,1863), *Neomida haemorrhoidalis* (F.,1787), *Platydema dejeanii* CAST.BRULLE,1831, *Diaclina testudinea* (PILL.MITT.,1783), *Neatus picipes* (HBST.,1797), *Metaclisa azurea* (WALTL,1839), *Tenebrio opacus* DUFT.,1812, *Menephilus cylindricus* (HBST.,1784), *Osmoderma eremita* (SCOP.,1763) and *Cerambyx cerdo* L.,1758.

The to date only randomly sampled species spectrum of saproxylic species in the proposed Defileul Jiului National Park contains a unique fauna relict of Europe-wide importance. It is expected that this area is home to the complete saproxylic beetle fauna of the natural forest communities of this region (MÜLLER ET AL. 2005b). The Romanian and probably the Ukrainian beech forests are the last real reference sites for complete wood beetle communities of the temperate central European forest communities. Even the forests of western Europe that are considered to be in a close to natural condition are extremely isolated with depleted species diversity, yet their ecological potential is much higher. This has to be taken into consideration with all natural forest research in Germany.

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