



Stag Beetle News

The European Stag Beetle Monitoring Network ([ESBMN](#)) is an international collaboration to monitor the European stag beetle with a uniform methodology. We aim to assess local and international population changes. If you missed the previous newsletters, find them [here](#). This newsletter can also be found in Italian and Spanish. In this 6th newsletter, you can expect our overview of the 2023 transect walks, early stag beetle sightings and as usual, we have some nice research news for you.

2023 transect walk results

Last year, 153 transect walks were registered from a total of 35 transects. This produced 309 stag beetle observations (*Lucanus cervus*, an increase of 8%) and more than 21 Lesser stag beetles (*Dorcus parallelipipedus*). So, despite fewer transect walks taking place, we had more observations. Probably, this is as many of you can now better estimate when is the best time period to carry out the transect walk. Also, the number of transect walks without observations is dropping sharply. This year, the top five best records came from two transects: 'Janików' in Poland and 'Parque Biológico de Gaia – Apatura' in Portugal: the first wrecorded 37 stag beetles in one transect walk, and the second 14. Two transects in the UK, 'Hatherop Road' and 'Taymount Rise to Thorpewood Ave, SE23', were walked the most: 10 and 9 times respectively.

Country	No. transects	No. transects with >5 transect walks for 2022	No. transect walks
United Kingdom	17	9	84
Belgium	9	1	33
Spain	2	2	12
Croatia	2	1	11
Netherlands	2	0	2
Portugal	2	1	7
Poland	1	0	5

Early sights of European stag beetle

Marcos Méndez (Area of Biodiversity and Conservation, Universidad Rey Juan Carlos, Madrid)

Adults of the European stag beetle usually appear in the central months of the year, mainly from late May to late July, depending on the country (GTLI, 2018). This is why the monitoring is focused in the summer months. However, sightings of individuals are possible throughout the whole year, but in very low numbers.

This year, the first report I got of a live stag beetle was a female seen on 14th March, in Asturias (northern Spain) (Fig. 1). The percentage of sightings in March or earlier in Spain is very low (< 2%) and most sightings outside the period May-August are of dead specimens (GTLI, 2018). Thus, I wondered whether unusually early sights of stag beetles also occurred in other countries and years.

I looked at the GBIF data (www.GBIF.org) for European stag beetles sights from January to March in the period 2022-2024 (last date: 29th March 2024). A total of 88 sights were reported, from a total of 14 countries, from Portugal to Sweden (Table 1). Most of the sights concerned dead specimens, followed by sights that lacked a photo or any other information that allowed to know whether the specimen was alive or dead (Table 1). A few sights concerned larvae (Table 1). In six cases, alive specimens were clearly spotted. In 2022, a male was seen on 6th March in Catalonia (Spain) and a female on 30th March in Kiev (Ukraine). In 2023, a male was seen on 14th January in Île-de-France (France) and another male on 27 March in Viseu (Portugal). In 2024, my first record was beaten by two sights: a female on 21th February in Bournemouth (UK) and a male on 28 February in Piemonte (Italy).



Fig. 1. Alive female stag beetle found in northern Spain on 14th March 2024 (© Ayesha González).

Table 1. Sights of European stag beetle included in GBIF data base during January to March in the period 2022-2024, sorted by type. Number of countries from which the sights were reported is also indicated, together with name of the southern- and northernmost country in the list.

	2022	2023	2024
Sights	33	35	15
No photo	16	8	2
Dead adult	13	23	9
Larva	2	2	2
Alive adult	2	2	2
Countries	11 (Portugal to Sweden)	12 (Portugal to Sweden)	7 (Spain to Germany)

Against my expectations, unusually early sights of alive adults of the stag beetle were not limited to southern European countries, where short spells of warm weather could more easily "awake" some beetles ahead of time. I invite the volunteers in the network to keep an eye on early stag beetles. With time, these now unusual sights can be informative of long-term trends in the phenology of this fascinating beetle.

References

GTLI (2018). Phenology of imagoes of *Lucanus* species (Coleoptera, Lucanidae) in Spain. *Boletín de la Sociedad Entomológica Aragonesa* 63: 159-164.

Science news

Historic folklore and medicinal uses of Stag Beetles

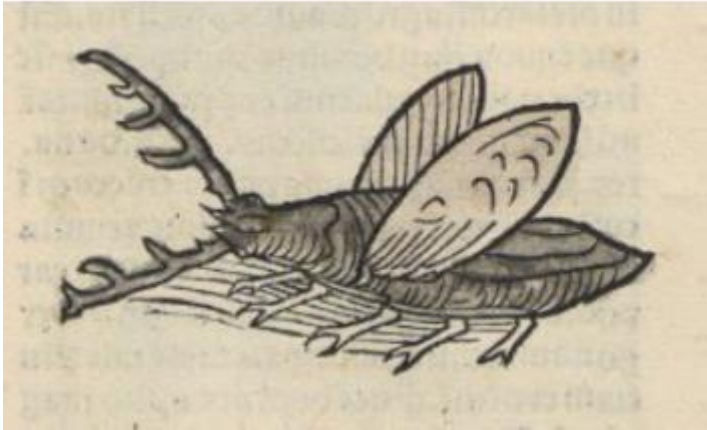
Based on: [Duffin C. 2023. The medicinal uses of Stag Beetles. *Pharmaceutical historian*, 53\(1\), 26-30](#)

The remarkable antlers of stag beetle have always mesmerised people's imagination. Nowadays we praise them for their emblematic example of sexual selection. Back in the days before modern science, people made other associations.

In German folklore, stag beetles are associated with the god of Thunder, Donar, giving their name *Donnergueg* (thunder beetle) and *Donnerschröter* (thunder spreader). People even believed they would set houses on fire, colloquially calling them *Feuerschröter* (fire spreader) or *Hausbrenner* (house burner). This originated from the belief that the larvae attracted lightning strikes while the opposite makes more sense, trees damaged by lightning strikes are a typical habitat. In Vosges (France) stag beetle heads worn on the hat offer protection both from lightning strikes and the evil eye. In the UK, they were referred to as the devil's imp, having been despatched from hell to cause damage to crops.

The medical applications enjoyed by male stag beetles bear seemingly no relation to its common folklore association with dark forces. As a medical treatment throughout Europe, the heads or mandibles from dead stag beetles were used as amulets.

These amulets were often mounted in gold or silver and worn around the neck or on headgear. They were used against evil forces, epileptic seizures and convulsions, bedwetting and cramp, and more widely against unspecified pain, headache, oedema, rheumatism, and to ease childbirth and various nervous disorders. Due to the believed curing, they were referred to as the *Krampfkäfer* (Spasm Beetle) in Austria. Live stag beetles were sometimes worn to transfer the disease to the beetle. Thomas Muffet wrote in 1658 that they were also 'boyled in wine, and the atteries of the armes be anointed with it, it cures Agues (malaria)'. Stag beetle oil was used to cure earache and deafness according to Caspar Schwenckfeld von Ossig (1603). Finally, in Spain, mandibles are used as a cure or even to prevent viper bites from people and cattle.



*Stylised image of the Stag Beetle, Ortus Sanitatis 1491, De Avibus, Cap. xxv.
(Source: Countway Medical Library)*

Unraveling the stag beetle pheromones

Deborah Harvey (Department of Biological Sciences, Royal Holloway University of London, Egham)

Based on: [Harvey D.J., Vuts J., Hooper A., Caulfield J.C., Finch P., Woodcock C.M., Gange A.C., Chapman J.W., Birkett A.M. and Pickett J.A. 2024. Novel pheromone-mediated reproductive behaviour in the stag beetle, *Lucanus cervus*. Scientific Reports, 14, 6037](#)

Monitoring the European stag beetle presents a challenge due to its brief adult life phase and limited activity, occurring for a few weeks of the summer. Consequently, researchers are constantly looking for ways to accurately monitor the species. One way method centres around how beetles locate one another in the wild. Many insects, including the stag beetle, employ chemical compounds known as pheromones to attract mates. In their recent paper, Deborah Harvey and colleagues report their discovery of stag beetle pheromones.

It is a well-known phenomenon that females can emit pheromones, promptly attracting numerous males. The article identifies the region of the beetle responsible for emitting these pheromones and the compound (a sesquiterpene) released, identified as (+)-longifolene. Males also produce two pheromones, namely (–)-β-barbatene and a second complex chemical.

Male stag beetles exhibited attraction to (+)-longifolene in laboratory tests and in the field. Females responded to the release of (–)-β-barbatene by taking a sexually receptive posture. Additionally, all males responded aggressively to the second unnamed compound, potentially serving a role in sexual selection.



The yellow glands on the front legs are responsible for the pheromone productions (Harvey et al. 2024).

Name your price: Willingness to pay for stag beetles

Based on: [Notaro S., Mastrogregori G. and Paletto A. 2023. People's perceptions and willingness to pay to protect saproxylic species in Alpine production forests. Journal for Nature Conservation, 70, 126514](#)

Umbrella species or mascots are used for many nature conservation projects. In this Italian study, they looked at the promoting aspects of species for so called veteran tree islands in managed forest. This because dead wood is a key element for many forest inhabiting species. Three species battled as candidate: Black woodpecker, Western barbastelle (a rare bat species) and European stag beetle. In this willingness to pay-study participants were asked how much they would pay (0-12€) to walk in a forest with low, medium or high numbers of one of the tree species. Despite respondents were overall well aware of the importance of dead wood for biodiversity, stag beetles were more associated with “fear”, “anger” and “disgust” and less with “joy” when compared to the woodpecker. Especially younger people had this aversion while older and higher educated people assigned higher values of “joy” towards stag beetles. And what were people willing to pay in the end? For Black woodpeckers, people want to pay €2.8 to 3.8 for medium to high population restoration. The results were non-significant for the Western barbastelle, meaning no additional payment and for the European stag beetle, the results were even negative (€-1.9 to -3.7). This means that people want compensation to walk in a forest with more stag beetles compared to today's population. Reading this, I realise we still have a long way ahead to persuade people of the importance of our beloved species.

France counted 36 283 stag beetles

Based on: [Josse H., De Flores M., Meriguet B., Monsavoit A. & Houard X. \(2023\). En quête d'insectes: Le Lucane cerf-volant. Bilan 2011-2023 et perspectives. Rapport d'étude Opie-OFB, 32 p](#)

Between 2011 and 2023, the ngo OPIE asked to report stag beetles in France. More than 15 000 people reported a total of 36 283 stag beetle observations. The species was found all over France with concentrations in densely populated areas. It is only absent in the higher mountain ranges and rare near the Mediterranean coast. It has become rare in the agricultural plains of northeastern France. While stag beetles are more reported in cities, they are probably more abundant in forests. Remarkably, stag beetles fly up to one month earlier in the north than in the south.



Results from a mark-recapture transect study

Based on: [Giannetti D., Schifani E., Leonardi S., Fior E., Sangiorgi S., Castracani C., Bardiani M., Campanaro A. & Grasso D.A. \(2023\). A multidimensional study on population size, deadwood relationship and allometric variation of *Lucanus cervus* through citizen science. *Insect Conservation & Diversity*, 16, 638–648](#)

In our monitoring, we ask you to count the number of stag beetles observed but you are never entirely sure that the same beetles are counted twice. In this Italian study, they not only counted the stag beetles along four transect in the Boschi di Carrega Natural Park but also captured and marked all of them. In this way you can see which beetles were captured before. On 706 captures, they found 651 unique specimens, resulting in a very low proportion of "recaptures". In this study, transects were walked

daily so, considering that our transects are walked weekly, you will only rarely encounter a beetle twice.

The markings also allowed to estimate the total population size surrounding the four transects to be around 3400 beetles. So most of the beetles are never found, even when monitoring daily.

Moreover, this study also measured all beetles and looked at dead wood amount as available habitat. This learned that the amount of dead wood was rather low and probably explained the rather small size of the stag beetles found.



Marking a beetle during the field work (© Daniele Giannetti)

Register Here

Text written by Arno Thomaes unless mentioned otherwise.

Do you have any questions for us, any ideas for our Newsletter next year or would you like to share your story? Let us know.

Have you published a scientific study on stag beetles? We would love to share a short overview of it here.

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This Newsletter was developed by Arno Thomaes, Marcos Méndez, Deborah Harvey, Alessandro Campanaro, Laura Bower, Bruno Meriguet and Petra Vijncke. Photo in the heading by: Pietro

Monteleone.

Our mailing address is:

Arno.thomaes@inbo.be

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European Stag Beetle Monitoring Network · Herman Teirlinckgebouw, Havenlaan 88 bus 73 · Brussel 1000 ·
Belgium

