

UDC 598.243.8(262.5)

## DISTRIBUTION OF SIBLING SPECIES YELLOW-LEGGED GULL, *LARUS MICHAHELLIS* AND CASPIAN GULL, *LARUS CACHINNANS* (CHARADRIIFORMES, LARIDAE), ON THE BLACK SEA COAST

**A. N. Tsvelykh**

Schmalhausen Institute of Zoology, NAS of Ukraine,  
vul. B. Khmelnytskogo, 15, Kyiv, 01030 Ukraine  
E-mail: TSV@izan.kiev.ua

A. N. Tsvelykh (<https://orcid.org/0000-0001-8970-5477>)

**Distribution of Sibling Species Yellow-legged Gull, *Larus michahellis* and Caspian Gull, *Larus cachinnans* (Charadriiformes, Laridae), on the Black Sea Coast.** Tsvelykh, A. N. — Distribution of sibling species *Larus cachinnans* (Pallas, 1811) and *Larus michahellis* (J. F. Naumann 1840) were studied on coast of the Black Sea. Originally, *Larus michahellis* breeds on seaside cliffs and rocky islets of the Southern part of the Black Sea and of the Crimean Peninsula. Having adapted to breeding on the roofs of buildings, this species is spread to the north along the seaside: to Novorossiysk on the eastern coast, to Constanta on the western one. Additionally, an isolated population of *Larus cachinnans* breeds on low-lying islands and sand spits mostly in the Northwestern Black Sea. Here, the species spreads on the seaside from Constanta northward to Karkinitian Bay. Further to the east, breeding populations of Caspian Gull are found on the Black Sea coast only at the southeastern edge of the Taman Peninsula to the south to Anapa. The coast of the Sea of Azov, adjacent to the northeastern part of the Black Sea, is densely populated by *Larus cachinnans*. Only in the southern part of the Sea of Azov, on the coast of the Kerch Peninsula, there is a small population of *Larus michahellis*.

Key words: *Larus michahellis*, *Larus cachinnans*, sibling species, distribution, expansion, Black sea.

### Introduction

Until recently, it was believed that *Larus cachinnans*, of the superspecies “herring gull” complex, was widespread in the Mediterranean and the Black Sea region. However, large-scale genetic studies of gulls of that complex have shown that *Larus michahellis* is spread in the Mediterranean and the adjacent Atlantic regions (Liebers et al., 2004). It was previously considered as a subspecies of *Larus cachinnans*. Both species are found in the Black Sea region. The estimated range of *Larus michahellis* in the Black Sea is limited to its southwestern coast, and *Larus cachinnans* is widespread in the northwestern, northern and most of the eastern Black Sea region according to maps based on the genetic studies (Liebers et al., 2004; Liebers-Helbig et al., 2010). In the latest report on the world’s birds (del Hoyo et al., 2014), the range of *Larus michahellis* also covers most of the southern coast of the Black Sea, and the range of *Larus cachinnans* is limited to its northwestern and northern coasts. At the same time, no gull populations were shown at the southeastern coast of the Black Sea and the sea coast of the Crimean Peninsula, which is completely untrue. In addition, the recent discovery of a large population of *Larus michahellis* on the Crimean Peninsula (Tsvelykh, 2016; Sikorsky, 2016; Tsvelykh, 2018) and the currently observed dispersal of this species on the Black Sea coast to the north radically change the configuration of the ranges of these sibling species on the Black Sea coast. The aim of this work was to investigate the current distribution of *L. cachinnans* and *L. michahellis* on the Black Sea coast.

### Material and methods

The author analyzed his own and published data on the distribution of *L. michahellis* and *L. cachinnans* in the Black Sea region. The results of the analysis of gull specimens collected at the Black Sea coast and stored in the funds of the Zoological Museum of Taras Shevchenko National University of Kyiv and the National Museum of Natural History of the National Academy of Sciences of Ukraine are used. The species *L. cachinnans* and *L. michahellis* were discriminated by the peculiarities of the coloration of primaries (Garner, Quinn, 1997; Gibbins et al., 2010). Adult *L. michahellis* is easily distinguished from *L. cachinnans* by the presence of an extensive black area between the white preapical spot and the white "tongue" on the inner vane of the outer (10th) primaries (fig. 1). In *Larus cachinnans*, the length of the black area between the edge of the white "tongue" on the inner vane of the outer primaries and the edge of the white preapical spot does not exceed the length of the white spot measured from the tip of the feather, but is almost twice as long in *L. michahellis* (Tsvelykh, 2016). The same is true for the 9th primaries. In addition, the white preapical spot on the 9th primaries, which is always present in the Caspian Gull (fig. 1, B, D), is absent in the Yellow-Legged Gull part (fig. 1, A, C), therefore all such birds are undoubtedly *L. michahellis*.

### Results and discussion

*L. michahellis* is distributed throughout the southern coast of the Black Sea in Turkey (Kirwan et al., 2008; Sozen et al., 2015). Obviously, the Yellow-legged Gull has long populated the southeastern Black Sea areas adjacent to the Turkish coast. On the Black Sea coast of Georgia, a large colony of "herring gulls" has long been known at the mouth of the Chorokhi River, near Kobuleti town, which is 20 km north of Batumi City (Boehme et al., 1987). The identification of those gulls as *L. michahellis* is proved by the analysis of museum specimens. The collection of the National Museum of Natural History of the National Academy of Sciences of Ukraine contains four gulls specimens caught in the same area, in Churuksu (the former name of Kobuleti) in the summer of 1910. Two adult birds in definitive plumage that were caught there on August 20, 1910 (fig. 1, A) and September 9, 1910 plainly belong to the species *L. michahellis*.

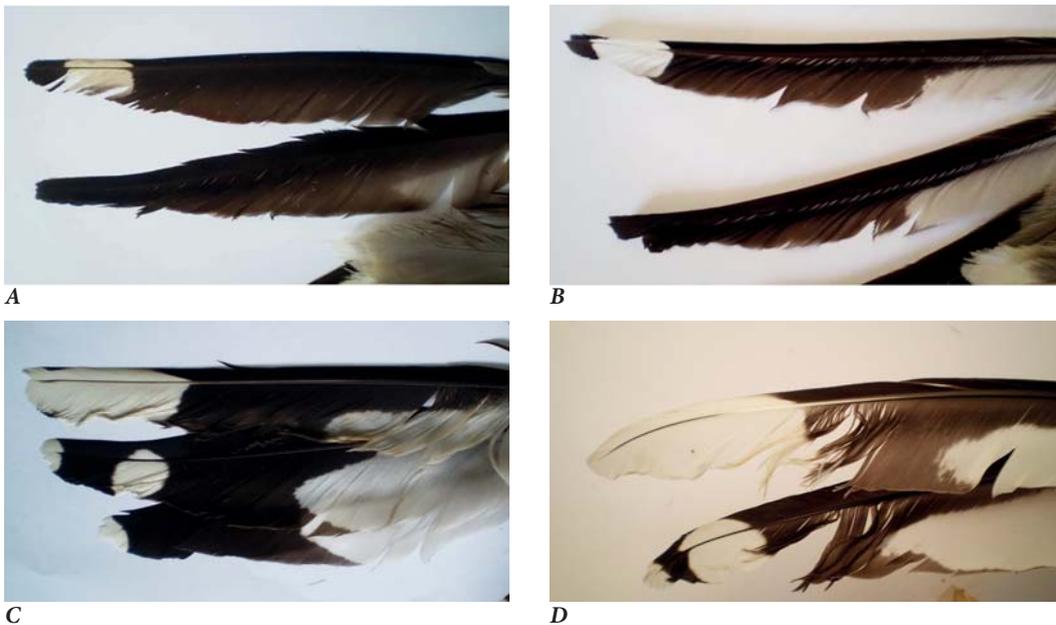


Fig. 1. Differences in coloration of the outer primaries of *Larus michahellis* (left column) and *Larus cachinnans* (right column) from the Black Sea coast. **A** — Kobuleti, Georgia. August 20, 1910 (collection of the National Museum of Natural History, the National Academy of Sciences of Ukraine), **B** — Karadag, Crimean Peninsula, Ukraine, July 2, 1946; (collection of the Zoological Museum of Kyiv National University), **C** — Vilko, Danube Delta, Ukraine, April 26, 1948 (collection of the Zoological Museum of Kyiv National University), **D** — Swan Islands, Karkinitian Bay, Ukraine, February 22, 1972 (collection of the National Museum of Natural History of the National Academy of Sciences of Ukraine).

Apparently, at the beginning of the XXI century, *L. michahellis* began to spread along the eastern coast of the Black Sea to the north. In 2008, V. I. Malandzia found *L. michahellis* nesting on the ruins of tall buildings off the coast of Abkhazia in northwestern Georgia (Belik, 2013). In 2014 and 2015, breeding of *L. michahellis* was recorded further north, on the Black Sea coast of Russia. The birds bred on the roof of a building in the seaside city of Sochi (Til'ba, Filipov, 2016). In 2018, a large colony of *L. michahellis* was discovered even further north, in the seaside City of Novorossiysk (Belik, 2018). The birds bred on the flat roofs of the buildings.

Along the western coast of the Black Sea, *L. michahellis* is distributed up to the city of Constanta in Romania to the north; all the gulls collected there, according to analysis of mitochondrial DNA, belonged to that species (Liebers et al., 2004). It should be noted that *L. michahellis* breeding in Constanta was known before. R. Klein and A. Buchheim (1997) found that gulls breeding on roofs of building in Constanta differed in plumage and structural characters from those breeding on temporary islets in coastal lagoons 50 km north of town. Roof-top breeders corresponded closely to the phenotype of *L. michahellis*, whereas lagoon breeders corresponded mostly to *L. cachinnans*. Roof-top breeders have been known in Romania and Bulgaria for over 100 years (Nankinov et al., 1997; Klein, Buchheim, 1997). Due to the obvious tendency of *L. michahellis* to spread along the western coast of the Black Sea, breeding in cities, it is necessary to discuss reports indicating the breeding of this species far north of Constanta, in the City of Odesa in Ukraine. In 2011, a nest of *L. cachinnans* was found in Odesa on the rooftop of a building (Rusev et al., 2011). Apparently, gulls bred there in 2009 as well (Rusev et al., 2011). Subsequently, it was suggested that these gulls were *L. michahellis* (Panchenko et al., 2015). The authors (Panchenko et al., 2015) referred to the personal communication of N. S. Atamas, who determined the gull species by the provided photographs. However, I failed to find out what criteria were used for the species identification of gulls, and the photographs, as it turned out, were subsequently lost (N. S. Atamas, personal communication; P. S. Panchenko, personal communication). Dr. I. T. Rusev kindly provided me for analysis with photographs taken by him at the gull nest in Odesa in 2011. The quality of the photographs was good enough to distinguish an extensive black gap between the inner edge of the white pre-apical spot and the end of the light "tongue" on the inner vane of the outer primaries of the gull's wing (fig. 2). Its length was almost twice the length of the white preapical spot, which indicates (see above) that this bird belongs to the species *Larus micha-*



Fig. 2. The Gull nesting on the roof of the building in Odesa. June 7, 2011. Photo by I. T. Rusev.



Fig. 3. The northernmost breeding point of *Larus michahellis* on the Black sea coast. A Yellow-legged Gull chick in a nest on the roof of the building in Odesa. June 7, 2011. Photo by I. T. Rusev.

*hellis*. Also, a number of additional features can be seen in the photograph with sufficient magnification. Although not individually diagnostic, they make it possible to distinguish most *Larus michahellis* from *Larus cachinnans* if combined with other features (Gibbins et al., 2010). Those additional traits are: a light pale yellowish iris of the eye, contrasting with the black pupil (in *Larus cachinnans*, the iris of the eye is usually very dark, not contrasting with the pupil, and the eye looks almost black), a deep red orbital ring (in *Larus cachinnans*, the color of the orbital rings varies from pale orange to red), rich yellow legs (many *Larus cachinnans* birds have pale yellowish legs during the breeding period, and only some have bright yellow legs), bright yellow bill coloration, with a strong red gonys spot (in *Larus cachinnans*, the bill is usually less bright, the gonys spot is reddish and relatively small). Thus it can be concluded that *L. michahellis* occasionally breeds in Odesa at least since 2009, and the nest (fig. 3) discovered by Rusev et al. (2011) indicates that Odesa is the most northern breeding area of this species in the Black Sea region. In addition to this case of proven breeding of *Larus michahellis* in Odesa, there is also a reported observation of a mixed pair of *L. michahellis* and *L. cachinnans* in a small colony of *L. cachinnans* located on a pier in waters of the Odesa seaport. There a male *L. michahellis* copulating with a female *L. cachinnans* were observed using powerful optics at a distance of more than 0.6 km, on April 1, 2015 (Panchenko et al., 2015).

The breeding sites of the Yellow-legged Gull in Odesa are located 300 km away along the coast from the nearest breeding sites in Constanta. However, adults of *L. michahellis*, singles or in groups, were often seen on the sea coast between the Danube Delta and Odesa in summer (Yakovlev, 2015; M. V. Yakovlev, personal communication; P. S. Panchenko, personal communication). It is possible that those birds could form pairs, which then bred in Odesa.

*L. cachinnans* is widespread in area north of Constanta along the western coast of the Black Sea. According to R. Klein and A. Buchheim (1997), gulls breeding on islets in coastal lagoons north of Constanta have the *L. michahellis* phenotype. All gulls breeding in this locality and studied by mitochondrial DNA analysis belonged to this species (Liebers et al., 2004). Analysis of museum specimens of gulls from the northern part of the Danube Delta (fig. 1, C) confirms the habitation of *L. cachinnans* there. To the north of the Danube Delta, *L. cachinnans* is distributed to the mouth of the Dnipro River and further to the eastern edge of the Karkinitian Bay along the Black Sea coast (fig. 1, D), where they breed in large colonies on low-lying islands off the northwestern shores of the Crimean Peninsula (fig. 4). *L. michahellis* is widespread on the Black Sea coast of the Crimean Peninsula (Tsvelykh, 2016). There are reports of its settlements on the southern coast of Crimea, on the Tarkhankut Peninsula and on the Kerch Peninsula (fig. 4). In the Crimean Peninsula, *L. michahellis* usually breeds on coastal cliffs and on coastal rocky islets. On the southern



Fig. 4. Settlements of *Larus cachinnans* (circles) and *Larus michahellis* (triangles) in the northern part of the Black Sea. Yellow figures — the species was determined by means of the analysis of mitochondrial DNA, red ones — by means of the analysis of museum specimens or photos of alive birds. According to Belik, 2018; Klein, Buchheim, 1997; Kuzikov, 2021; Liebers et al., 2004; Mnatsekanov et al., 1992; Sikorsky, 2016; Siokhin et al., 2000; Til'ba, Filipov, 2016; Tsvelykh, 2016, 2018 and data from this study.

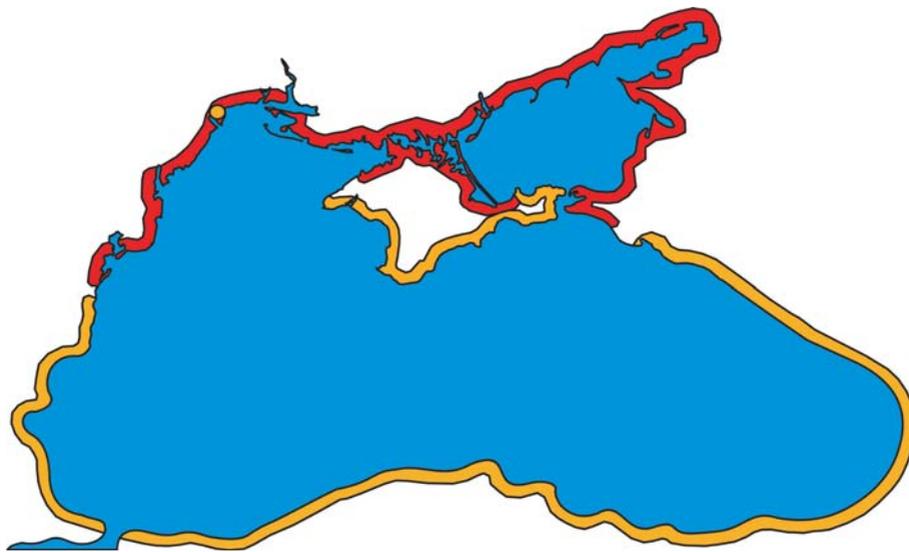


Fig. 5. Breeding ranges of *Larus michahellis* (orange) and *Larus cachinnans* (red) on the Black sea and Sea of Azov coasts.

coast of Crimea, gulls often breed on the rooftops of multi-storey buildings in villages and towns (Beskaravainy, 2008). It is noteworthy that in Crimea, gulls began to breed on the rooftops of buildings in the mid-1990s only (Beskaravainy, Kostin, 1998). The easternmost settlement of *L. michahellis* on the Black Sea coast of the Crimea is Opuk mount in the south of the Kerch Peninsula (Sikorsky, 2016; Tsvelykh, 2016); it has existed here for at least a hundred years (Tsvelykh, 2018). Further to the east, *L. cachinnans* is widespread on the Caucasian coast of the Black Sea (fig. 4). There, large populations of these gulls were found near the southeastern edge of the Taman Peninsula in the vicinity of Anapa city and, to the north of it, on the Kiziltash estuaries (Mnatsekanov et al., 1992). Further south along the Black Sea coast of the Caucasus, gull populations are absent up to Novorossiysk, where *L. michahellis* breeds on the rooftops of buildings, having settled along the eastern coast of the Black Sea from the southern side (see above).

The coast of the Sea of Azov connected by a narrow strait with the northeastern part of the Black Sea, is abundantly populated by *L. cachinnans*. Along the coast there are numerous settlements of that species (fig. 4), on low-lying islands and on sand spits. On the coast of the Sea of Azov, one small settlement of *L. michahellis* is known: the birds breed on coastal rocks near Cape Kazantip, in the north of the Kerch Peninsula. Interestingly, a large breeding colony of *Larus cachinnans* is located less than 10 km south of this settlement, on the low-lying islands of the saltwater Aktash Lake. There, the settlements of the studied sibling species are as close as possible (fig. 4), which may create for them preconditions for limited hybridization (Tsvelykh, 2016).

The data obtained make it possible to outline the current ranges of *L. cachinnans* and *L. michahellis* on the Black Sea coast. *Larus michahellis* is spread along the entire southern coast of the Black Sea; along the eastern coast, it is distributed northward to Novorossiysk, and along the western coast to Constanta (fig. 5). In the northern part of the Black Sea, this species is widespread on the sea coast of the Crimean Peninsula and breeds in isolation in Odesa. *Larus cachinnans* occurs mainly in the northwestern part of the Black Sea from the Constanta northward to the Karkinitian Bay (fig. 5). In the northeastern part of the Black Sea, that species is spread only at the southeastern edge of the Taman Peninsula southward to Anapa. *Larus cachinnans* is widespread along the coast of the Sea of Azov (fig. 5).

I am very grateful to I. T. Rusev for the very valuable photographs provided for this study and to P. S. Panchenko, M. V. Yakovlev and N. S. Atamas for providing me with important information.

## References

- Belik, V. P. 2013. Recent transformation of avifauna of Northwest Caucasus and its causes. *Archives of the Menzbiier Ornithological Society*, **2**, 208–230 [In Russian].
- Belik, V. P. 2018. Mediterranean Gull *Larus michahellis* colony in Novorossiysk. *The Russian Journal of Ornithology*, **27** (1614), 2433–2441 [In Russian].
- Beskaravainy, M. M. 2008. *Birds of seacoasts of Southern Crimea*. Nizhnia Orianda, Simferopol, 1–160 [In Russian].
- Beskaravainy, M. M., Kostin, S. Yu. 1998. Distribution, numbers and some peculiarities of the breeding ecology of the Shag and the Herring Gull in the South-Eastern Crimea. *Berkut*, **7** (1–2), 25–29 [In Russian].
- Boehme, R. L., Zhordania, R. G., Kuznetsov, A. A. 1987. *The birds of Georgia*. Sabchota Sakartvelo, Tbilisi, 1–128 [In Russian].
- Garner, M., Quinn, D. 1997. Identification of Yellow-legged Gulls in Britain. *British Birds*, **90**, 25–62.
- Gibbins, Ch., Small, B. J., Sweeney, J. 2010. Identification of Caspian Gull. Part 1: typical birds. *British Birds*, **103**, 142–183.
- del Hoyo, J., Collar, N. J., Christie, D. A., Elliott, A., Fishpool, L. D. C. 2014. *Illustrated Checklist of the Birds of the World, Volume 1 Non-Passerines*. Lynx, Barcelona, 1–903.
- Kirwan, G. M., Boyla, K., Castell, P., Demirci, B., Ozen, M., Welch, H., Marlow, T. 2008. *The Birds of Turkey*. Christopher Helm, London, 1–512.
- Klein, R., Buchheim, A. 1997. Die westliche Schwarzmeerküste als Kontaktgebiet zweier Grossmowenformen der *Larus cachinnans*-Gruppe. *Vogelwelt*, **118**, 61–70.
- Kuzikov, I. V. 2021. About the nesting of the Mediterranean Gull *Larus michahellis* and the discovery of its nest on the roof of a building in Livadia park (Southern coast of Crimea) in May 2021. *The Russian Journal of Ornithology*, **30** (2084), 2944–2949 [In Russian].
- Liebers, D., de Knijff, P., Helbig, A. J. 2004. The herring gull complex is not a ring species. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, **271** (1542), 893–901.
- Liebers-Helbig, D., Sternkopf, V., Helbig, A. J., de Knijff, P. 2010. The Herring Gull Complex (*Larus argentatus - fuscus - cachinnans*) as a Model Group for Recent Holarctic Vertebrate Radiations. In: *Evolution in Action*. Springer-Verlag, Berlin Heidelberg, 351–371.
- Mnatsekanov, R. A., Emtyl, M. N., Til'ba, P. A., Soloviev, S. A. 1992. Abundance and distribution of the Herring Gull in the Krasnodar Region. In: *The Herring Gull and related forms: distribution, systematics, ecology*. Stavropol, 60–62 [In Russian].
- Nankinov, D. N., Simeonov, S. D., Michev, T. M., Ivanov, B. E. 1997. *Fauna Bulgarica, 26, Aves, part 2*. Academic Publishing House 'Prof. Marin Drinov' and Publishing House 'Pensoft', Sofia, 1–428 [In Bulgarian].
- Panchenko, P. S., Formanyuk, O. A., Shvets, A. A. 2015. On the finds of new bird colonies in the city of Odesa and its environs. In: *Birds of the Azov-Black Sea region. Materials of the 34th Azov-Black Sea Ornithological Working Group*, Odesa, 57–64. [In Russian].
- Rusev, I. T., Rad'kov, D. V., Kurochkin, S. L. 2011. The Yellow-Legged Gull (*Larus cachinnans*) in Odesa and its nesting on a roof of the building. *Branta*, **14**, 106–111 [In Russian].
- Sikorsky, I. A. 2016. Mediterranean Gull *Larus michahellis* — nesting species of the Black sea coast of Crimea. *The Russian Journal of Ornithology*, **25** (1326), 3069–3074 [In Russian].
- Siokhin, V. D., Chernichko, I. I., Andryushchenko, Yu. A., et al. 2000. *Numbers and distribution of breeding waterbirds in the wetlands of Azov-Black Sea Region of Ukraine*. Branta, Melitopol, Kiev, 1–476 [In Russian].
- Sozen, M., Erturhan, M., Boyla, K. A., Tozsın, T., Soydas, M. 2015. *The Birds of Zonguldak*. OCAK, Zonguldak, 1–426 [In Turkish].
- Til'ba P. A., Filipov V. L. 2016. Nesting of the Mediterranean Gull *Larus michahellis* on the Black sea coast of Caucasus. *The Russian Journal of Ornithology*, **25** (1244), 376–379 [In Russian].
- Tsvelykh, A. N. 2016. Distribution of *Larus michahellis* J. F. Naumann and *Larus cachinnans* Pallas on the Crimean Peninsula. *Branta*, **19**, 160–165 [In Russian].
- Tsvelykh, A. N. 2018. Decrease of numbers of the Yellow-legged Gull *Larus michahellis* J. F. Naumann on the Crimean Peninsula at the frontier of the XX–XXI centuries. *Branta*, **21**, 73–81 [In Russian].
- Yakovlev, M. V. 2015. New species in ornithofauna of the Danube Biosphere Reserve. *Berkut*, **24** (1), 1–8 [In Russian].

Received 9 March 2021

Accepted 30 March 2022