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THE EUROPEAN AUTUMN MIGRATION PATTERN OF THE GARDEN WARBLER, *SYLVIA BORIN* – A BASIC ANALYSIS OF ORIENTATION CAGE FIELD DATA

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ABSTRACT

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The introduction of an effective method for studying the local headings of migrants using 'orientation cages' has made it possible to study the migration patterns of small passerine nocturnal migrants. Numerous papers have been published on varied samples of local data collected using this method. A rough generalization was presented at the 2019 Meeting of the European Ornithologists Union and subsequently published in *The Ring*. Case studies on data collected for the Blackcap have already been published, and further studies on other species were suggested. The presented work is the next study of this kind, on the migration pattern of the Garden Warbler, using data from orientation tests collected in autumn as part of the work of the SEEN (SE European Bird Migration Network). The data comprises 2,593 tests performed at 31 ringing sites in Central/Eastern Europe and the Middle East. The paper continues the discussion of application of the method to present migration patterns in a geographically wide territory. The general data evaluation methods in this work are exactly as described in the earlier papers. The paper discusses azimuths of arrival and departure tracks at every ringing site, their linearity, number relations between departing and arriving headings, and the general pattern of migration streams followed by different groups of migrants.

The hypothesis put forth earlier, stating that the arrival/departure heading axes shown in studies using orientation cages are situated linearly, is once again confirmed and can be used as a general assumption in this type of study. The average deviations are very small and are negligible for drawing general migration patterns. In some cases, however, there were deviations caused by the geographic location of the study site. This problem should be discussed in more detail when more species data become available. Nine migration streams are defined in the study area, which are presented, for simplicity, using different names and colours on maps. Southward and south-eastward streams are dominant and distributed similarly to the streams of the Blackcap. The most pronounced is a stream shown in yellow (*YELLOW stream*), which is directed from the wide area of central and eastern Europe to the Arabian Peninsula. The *BLACK* and *NAVY* streams are the most intriguing (running nearly longitudinally) and require a great deal of attention in further analyses of migration in the Mediterranean. Two styles of presentation of the species migration pattern are discussed, of which the location style of presentation seems to be

more precise. The simpler presentation style that shows only general heading axes could be used to compare the general patterns of different species.

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