Changes to the avifauna of Vas County from the 19th century to present

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Abstract – In this publication the change of the avifauna was revealed by compared to the previous three published cheklists (CHERNEL 1898, FROMM 1929, BARBÁCSY 1987) and the current list of the birds (GYURÁCZ ET AL. 2010) of Vas County.

Keywords: avifauna /fauna type/Vas County

1. INTRODUCTION

The climate and other environmental factors may cause the expansion or regression of the bird species's areas. These area changes can result the colonisation of a new species or the extinction of an existing species in a given geographical region (BURTON 1995). In the last twenty years, the new species observed in Hungary came from different climatic areas (CSÖRGŐ & HARNOS 2009). The relationships of the spread of the bird species and global climate change have been investigated by relatively few studies (BÖHNING-GAESE & LEMOINE 2004, LEECH & CRICK 2007, HUNTLEY ET AL. 2008). In this study we compared the previous three published cheklists (CHERNEL 1898, FROMM 1929, BARBÁCSY 1987) and the current list of the birds (GYURÁCZ ET AL. 2010) of Vas County. The main aspects of the analysis were: 1. To register the bird ordo and fauna type composition of the breeding and non-breeding avifauna. 2. To reveal the ordo and fauna type diversity of the breeding and non-breeding avifauna. 3. To predict the change of the avifauna in the 21st century.

2. STUDY AREA AND METHODS

The area of Vas County can be found in the West Hungary. An annotated list of the birds of Vas county was published in 2010 (GYURÁCZ ET AL. 2010). We separated the total avifauna (list of breeding and non-breeding species), breeding avifauna (list of breeding species) and non-breeding (list of migrating and wintering species) avifauna of Vas County in the four checklists. The species of the different avifaunas were grouped according to bird ordo and fauna type (MME NOMENCLATOR BIZOTTSÁG 2008). We compared the distribution of species richness (number of species) of bird ordos and fauna types by fit test (Chi^2-prob and Monte Carlo test). The ordo and fauna type diversities of the different avifaunas were compared by Rényi diversity profiles. Predict of the change of the bird ordo and fauna type species richness to 2050 was made by ARIMA model as a univariate analysis (YAFFEE & MCGEE 2000).

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3. RESULTS AND CONCLUSIONS

Twenty bird species have not been observered since 1950 in Vas County:

1. *Anser erythropus* (Linnaeus, 1758) Lesser White-fronted Goose
2. *Tetrao tetrix* Linnaeus, 1758 Black Grouse
3. *Gyps fulvus* (Hablizl, 1783) Griffon Vulture
4. *Aegypius monachus* (Linnaeus, 1766) Cinereous Vulture
5. *Circaetus gallicus* (Gmelin, 1788) Short-toed Snake Eagle
6. *Aquila heliaca* Savigny, 1809 Asian Imperial Eagle
7. *Porzana pusilla* (Pallas, 1776) Spotted Crake
8. *Burhinus oedicnemus* (Linnaeus, 1758) Eurasian Stone-curlew
9. *Charadrius morinellus* Linnaeus, 1758 Eurasian Dotterel
10. *Tringa stagnatilis* (Bechstein, 1803) Marsh Sandpiper
11. *Sternula albifrons* (Pallas, 1764) Little Tern
12. *Syrrhaptes paradoxus* (Pallas, 1773) Pallas's Sandgrouse
13. *Strix uralensis* Pallas, 1771 Ural Owl
14. *Aegolius funereus* (Linnaeus, 1758) Boreal Owl
15. *Acrocephalus paludicola* (Vieillot, 1817) Aquatic Wabler
16. *Lanius senator* Linnaeus, 1758 Woodchat Shrike
17. *Pyrrhocorax graculus* (Linnaeus, 1766) Alpine Chough
18. *Sturnus roseus* (Linnaeus, 1758) Rosy Starling
19. *Carduelis hornemanni* (Holboell, 1843) Arctic Redpoll
20. *Pinicola enucleator* (Linnaeus, 1758) Pine Grosbeak

The following bird species are in the annotated list of the birds of Vas County or its appendix (bold) (Gyurácz et al. 2010), but they are missing from the previous three lists (CHERNEL 1898, FROMM 1929, BARBÁCSY 1987) because they were not observered before mid-1980 in Vas County or the authors did not write their name in the lists:

1. *Anser brachyrhynchus* Baillon, 1834 Pink-footed Goose
2. *Alopochen aegyptiaca* (Linnaeus, 1766) Egyptian Goose
3. *Melanitta fusca* (Linnaeus, 1758) Velvet Scoter
4. *Phalacrocorax pygmeus* (Pallas, 1773) Pygmy Cormorant
5. *Buteo rufinus* (Cretzschmar, 1827) Long-legged Buzzard
6. *Recurvirostra avosetta* Linnaeus, 1758 Pied Avocet
7. *Pluvialis squatarola* (Linnaeus, 1758) Grey Plover
8. *Calidris minuta* (Leisler, 1812) Little Stint
9. *Limosa lapponica* (Linnaeus, 1758) Bar-tailed Godwit
10. *Arenaria interpres* (Linnaeus, 1758) Ruddy Turnstone
11. *Phalaropus fulicarius* (Linnaeus, 1758) Red Phalarope
12. *Larus michahellis* J. F. Naumann, 1840 Yellow-legged Gull
13. *Larus pipixcan* Wagler, 1831 Franklin's Gull
14. *Columba livia* Gmelin, 1789 Feral Pigeon
15. *Glaucidium passerinum* (Linnaeus, 1758) Eurasian Pygmy Owl
16. *Apus melba* (Linnaeus, 1758) Pallis Swift
17. *Tarsiger cyanurus* (Pallas, 1773) Red-flanked Bluetail
18. *Sylvia melanocephala* (Gmelin, 1789) Sardinian Warbler
19. *Phylloscopus proregulus* (Pallas, 1811) Pallas' Leaf Warbler
20. *Phylloscopus inornatus* (Blyth, 1842) Yellow-browed Warbler
21. *Carduelis flavirostris* (Linnaeus, 1758) Twite
22. *Carpodacus erythrinus (*Pallas, 1770) Common Rosefinch
23. *Emberiza cia* Linnaeus, 1766 Rock Bunting

The first record of Red-flanked Bluetail (*Tarsiger cyanurus*) in Hungary was on 12th October 2010 at Tömörd Bird Ringing Station, Vas County.

The sepcies richness of the ordo *Charadriiformes* in the total avaifauna increased significantly in the last 150 years due to established of the water reservoirs and other artificial small lakes during the 20th and 21st centuries in Vas County (Fig. 1). The most species of the ordo *Charadriiformes* migrating or wintering in Vas County were belonged to the arctic fauna type. The species richness and diversity of the fauna types (Fig. 3A) of the breeding avifauna did not change signficantly from the 19th century to the 21st century. The diversity of the fauna types of the migrating-wintering avifauna was singficantly lower in the end of 19th and early 20th century than it was in the end of 20th and early 21st century (Fig. 3B). For a change in avifauna referred to the global warming was not observed. According to time-series modelling the species richness of ordo *Charadriiformes* grow up to 2050 in Vas County (Fig. 2)

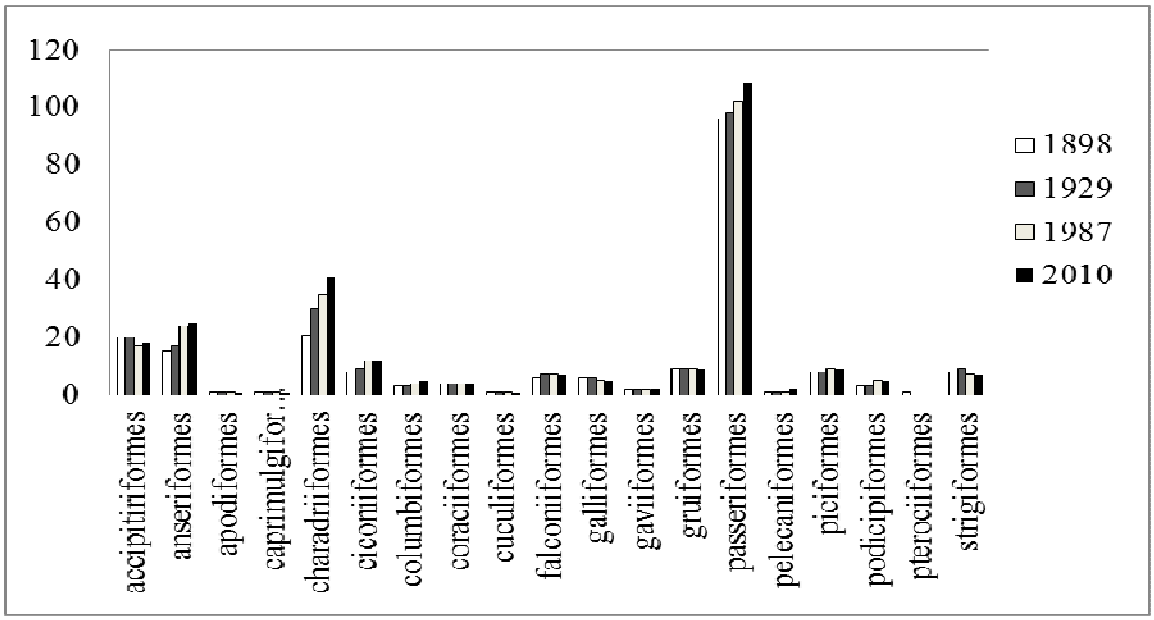

Figure 1. Species richness of bird ordo of the total fauna in four cheklists of Vas County. Charadriiformes: Chi^2 = 7.69, MC: P=0.04

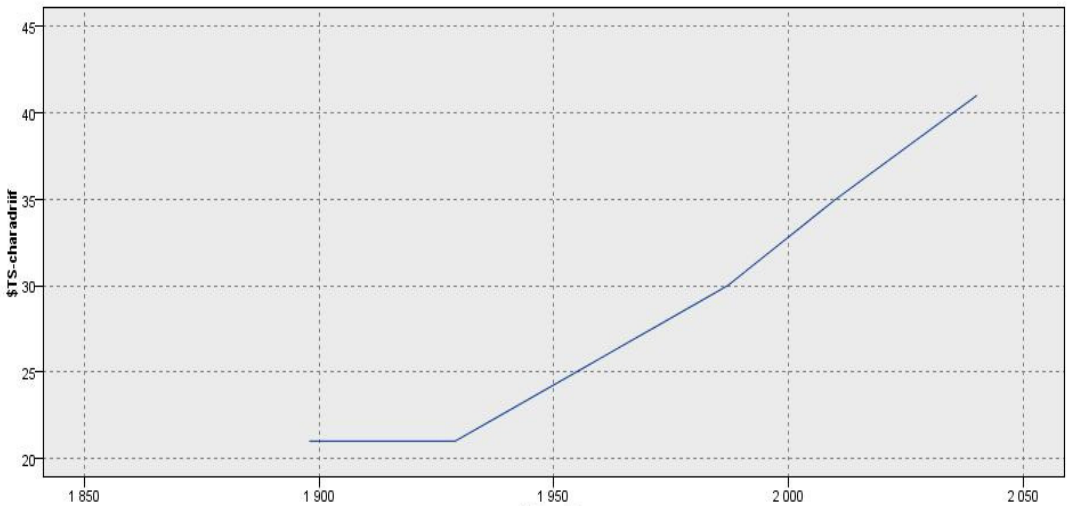

Figure 2. Change of the species richness of Charadriiformes to 2050 according to ARIMA model

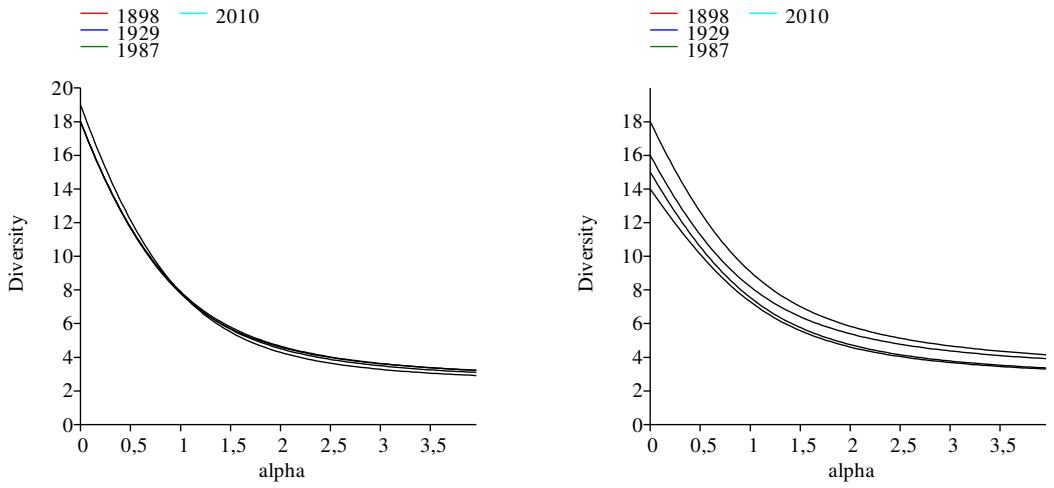

Figure 3. Fauna type diversity profiles of the breeding (A) and non-breeding (B) avifauna of the four cheklists in Vas County.

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