

Changes in winter flock size and sex ratio in Great Tit (*Parus major*)

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Extra feeding of the birds in winter is common activity. Several ringers (author's personal observations, Aarne Ots' *etc*) have noticed that amongst the wintering Great Tits (*Parus major*) there are up to twice as much males. Though up until now in Estonia there has not been detailed description of the Great Tit's winter flocks' sex ratio.

In 2008 and 2009 (from October 27 – February 8) in the village of Tääksi in Viljandi county feeding table visiting birds were caught with a 2,5x8 m mist net during random days. Mist net was used to eliminate a possible selective effect of the automatic traps on catching results. Probably resulting from difference in body measurements, a strict hierarchy exists in the Great Tit's flock, where male birds dominate over females and young birds, being more aggressive and daring (Cramp 1993) and thus can end up in the traps more often. Single catch lasted for 3.5 to 5 hours. In total birds were caught during 8 days (see Fig.1). A total of 313 Great Tits were caught and 38 of them were recoveries. According to the catching we can estimate changes in Great Tit flocks' size and generic structure visiting feeding table.

The number of caught Great Tits was from the end of October 2008 (sex ratio of males and females was ♂:♀= 1.12) until the end of December's second decade (♂:♀=1.39), when weather was relatively warm, remarkably high – over 50 individuals a day. Up until November the 18th percentage of the birds, who were ringed during previous catching days, were so low (n=4) that this made it seem that on the one hand the migration was continuing in the middle of November. On the other, obviously the mild weather did not force them to tie themselves to the specific feeding table, wherefore birds flocked around and visited feeding tables which situated relatively far away. Last argument seems to be verified catch (30.11.2008) after the great snowstorm and harsh

weather, when 18 individuals were caught and 9 of them were ringed during previous days. The situation in the middle of December resembled generally with the one in the end of October and in the beginning of November (multitude of Great Tits, accompanied by the low percentage of the ringed individuals [$n=6$]) with one exception: sex ratio ($\sigma:\varphi$) of the caught birds was already 2.00 and rising fast, reaching its maximum (2.71) in the beginning of the third decade of January 2009 (Fig. 1).

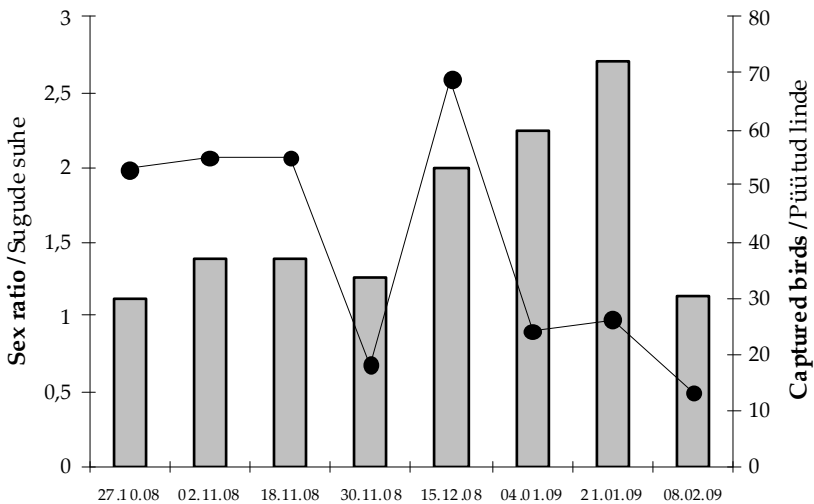


Figure 1. Sex ratio (bars) and number of captured individuals (dots) of Great Tit winter flock.
Joonis 1. Rasvatihaste talisalga sugude suhe ($\sigma:\varphi$ tulbad) ja püütud isendite arv (punktid).

Further on the number of Great Tits visiting feeding table decreased considerably and on the 8th of February with thaw only 13 individuals were captured and none of them was recovery. Sex ratio was at the same level as in the end of October (1.14) and further catching was ended.

Even though at least 277 individuals visited the feeding table, the number of individuals (individuals who were captured at least 3 times during a long period) in the main flock was surprisingly small – 4

individuals (2 females and 2 males). Obviously the number of individuals regularly visiting the feeding table was larger, because once caught the birds became more cautious and capturing them the second time is not so likely. Also the mist nets catching effectiveness is not 100%.

Clearly the changes in size and structure of winter flocks in Great Tits' population are an interesting phenomenon, which deserves additional studies. More attention should be paid to the migration activeness in the autumn, to the weather conditions during capturing, to the winter flock's age-specific structure and, why not, to the breeding success. Obviously during the additional studies it is necessary to ring the Great Tits near the feeding tables with colour-ring to ascertain the size of the main flock and according to appropriate information the „origin“ of the guests.

Literature: — Cramp, S., Perrins, C. M., Brooks, J. D., Dunn, E., Gillmor, R., Hall-Craggs, J., Hillcoat, B., Hollom, P. A. D., Nicholson, E. M., Roselaar, R. S., Seale, W. T. C., Sellar, P. J., Simmons, K. E. L., Snow, D. W., Vincent, D., Voous, K. H., Wallace, D. I. M. and Wilson, M. G., 1993. *Parus major*, Great Tit. Pages 255–269 in: C. M. Perrins and J. D. Brooks (eds). *Handbook of the Birds of Europe the Middle East and North Africa. The birds of the western Palearctic VII : Flycatchers to Shrikes*. Oxford University Press, New York.