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# At the problem of the initial evolution of the Palaearctic warblers (Sylviidae, Aves)

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Evolutional interrelations between different groups of birds that belong to the Silviidae family *sensu* Sibley & Monroe (1998) are completely unknown. The majority of the warblers from the northern Palaearctic belong to the subfamily Acrocephalinae. The monophyly of the group included warblers from the genera *Acrocephalus*, *Cettia*, *Locustella*, *Phylloscopus* and allied seems to be possible, although it is not confirmed by some modern researches (Alström et al., 2006).

Recent Acrocephalinae warblers are rather uniform in general features of their ecology and morphology: all species are quite small insectivorous birds with dull plumages lacked distinct sexual and age polymorphism. The social behaviour of these birds is more diverse. All bush-warblers (*Cettia cetti*, *Horeites* spp., *Urosphena* spp.) with known social systems are polygynous, with rather short and simple, poorly variable male advertising songs; the main part of the other warblers tend to be monogamous (cf. Leisler et al., 2002), male songs are more complex, usually with mimic phrases. It is hard to imagine a possible common ancestor of these groups.

Acrocephalinae warblers are closed phylogenetically to the babblers (subfamily Timaliinae): two groups are thought to be sister taxa. Comparisons between warblers and babblers can give an insight in resolving the problem of warbler evolution.

We investigated biology and social behaviour of warblers in 1999-2005 at the Kalmykia Republic, Krasnodar Region and at the South Ussuriland. Our data about the babblers were gathered from XII.2005 to VI.2006 at the deciduous tropical forest at the southern Vietnam (11º 25' N 107º 25' E) and belong to *Macronous gularis* (MG), *Macronous kelleyi* (MK), *Malacopteron cinereum* (MC), *Pellorneum ruficeps* (PR), *Pellorneum tickelli* (PT), *Malacocincla abbotti* (MA); also were studied laughingthrushes *Garrulax leucolophus* (GL; subfam. Garrulacinae).

Babblers and laughingthrushes start breeding at the dry season (from January or March) and finish nesting at the end of June. Birds of many species (MG, MK, MC, GL) tend to form flocks in nonreproductive period (usually small – about 6 birds), the others (PR, PT, MA) can be seen one at a time, or in pairs. Territory choice usually take place after the pairing, males mark nest sites by means of rather simple loud songs. All studied species are monogamous; extra-pair copulations are rare (except MC). Only GL is a communal breeding species (probably obligate). MA can have two successful breeding attempts in a year; the others are probably single-breeding (although replacement clutches are common).

Babblers in flocks regularly allopreen their partners or relatives. Different babblers (but not laughingthrushes) have similar allopreening displays included a distinct advertising pose demonstrated by the bird that wants to be allopreened. Ritualized allopreening is thought to have a value of maintaining social interactions between familiar birds in flocks. This behaviour can be rarely seen in PR. MA lacks allopreening display, although the latter is partially replaced by another form of behaviour: females during the initial stage of the nesting circle are allofed by their partners.

MA resembles Acrocephalinae birds by lacking flock behaviour and ritualized allopreening (allofeeding is known for *Acrocephalus scirpaceus*). MA shares a number of features with some bush-warblers, among it the general appearance, deep cup-shaped nest, red eggshell pigments,

hatchlings pterilosis, peculiarities of partners participating in breeding activities (males do not construct nests and incubate clutches, but feed chicks), and others. As in bush-warblers, MA males have short poorly variable songs, birds regularly sing after pairing. The MA songs have territorial function and are addressed to neighbours. Male songs of bush-warblers are also addressed to females.

The degree of relatedness between MA and bush-warblers is not clear and can be discussed. Nevertheless, the studying of MA social behaviour and biology can help to understand ways of initial evolution of the Acrocephalinae warblers. The switching to the solitary life in babblers is correlated with changes of the foraging behaviour. Babblers that form flocks search for food in tree or bamboo crones (MC, MK, MG). Birds that belong to solitary species find their food on the ground (PR), close to the ground in bamboo thickets (PT) or catch rather big invertebrate prey in crones of rattan palms that not form continuous plantations (MA).

Babblers are solitary birds, whereas warblers are migratory. Male warblers usually arrive to breeding grounds before females and begin to demonstrate territories. Nevertheless, some monogamous warblers have two distinct variants of pair formation: on territories previously advertised by males or, as in babblers, before the nest site choice (*Phragmaticola aedon*, *Acrocephalus scirpaceus*, *A. agricola*, *Locustella luscinioides*, *Hippolais pallida*, etc.: our data).

We believe that Acrocephalinae warblers could have a common babbler-like ancestor. MA shows how general features of warbler biology and behaviour could be evolved from the babbler type. Bush-warblers preserved babbler-like poorly variable songs and regular singing after pairing, and lost the strictly monogamy and the possibility of pairing outside the male territories. We believe that the prolonged singing period in bush-warblers males, that allows them to mate with more than one female, is shared with a sedentary monogamous ancestor. It could become a preadaptation to polygamy, when got the female advertising function. Reed-warblers, leaf-warblers and birds from relative genera saved monogamy (although some species became polygynous). The complex song of monogamous warblers, usually variable and full of mimicry phrases, could be evolved from the subsong that is known for MA and other babblers and have a variable structure.

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