



## Expedition

«Studying of soil fauna of Primorsky Krai of the Far East»  
August 2-14, 2017

**Participants:** Kuznetsova N.A. – professor of MPGU, Kuprin A.V. – senior researcher Federal Scientific Center of the East Asia Terrestrial Biodiversity FEB RAS, Geraskina A.P. – senior researcher of CEPF RAS



**The purpose of scientific work:** to study the structure of the diversity of the communities of collembola and earthworms in the forests of the Primorye Territory

**Places of researching:** the Ussuri Nature Reserve, the Sikhote-Alin Nature Reserve and their surroundings.

**Types of forests for quantitative counts of soil invertebrates:**

1. Valley mixed forest. Primorsky Krai, Terneysky District, the surroundings of the Sikhote-Alin Nature Reserve.
2. Oakery forest with hazel. Primorsky Krai, Terneysky District, the Sikhote-Alin Nature Reserve.
3. Spruce-fir forest with *Rhododendron fauriei*. Primorsky Krai, Terneysky District, the Sikhote-Alin Nature Reserve.
4. Valley mixed forest. Primorsky Krai, Chuguevsky District, the Upper–Ussuri station FSC.
5. Valley broad-leaf-cedar forest. Primorsky Krai, Shkotovsky District, Ussuri Nature Reserve.

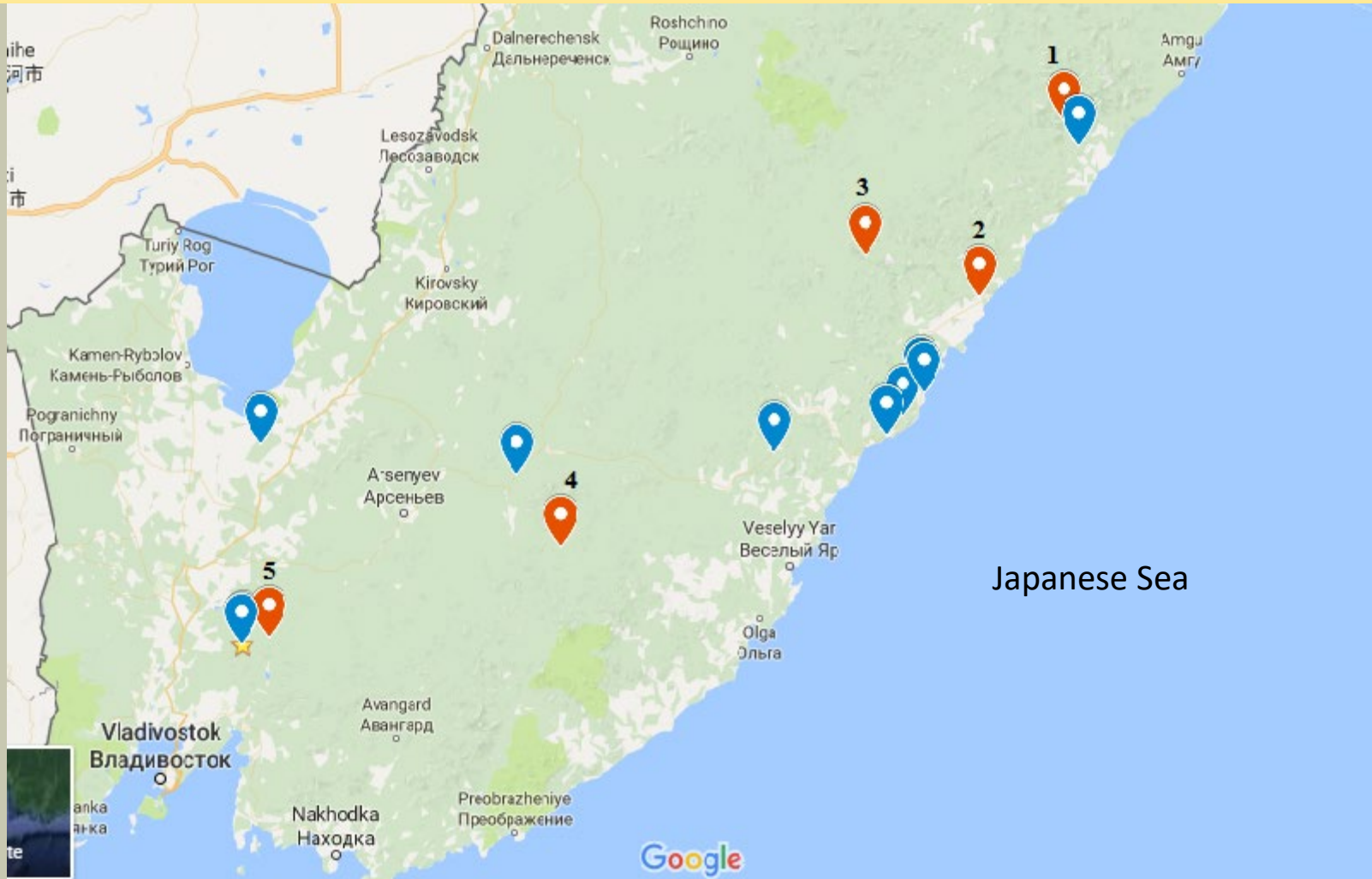
The valley mixed tall- and low-herb forests and oakery with hazel are typical in the Primorsky Territory. Dark coniferous forests with *Rhododendron fauriei* and boreal ground cover are rare and unique forest communities.

## Research methods

- To study the spatial distribution of collembola and quantify them in each type of forest, a series of litter and soil samples were taken using a fractal design (81 samples in each series, total 405 samples).
- To the purpose of faunistic researching of collembola were taken 24 samples (volume 1 liter) of different substrates (litter, rotten wood, moss from trees and stones) and 22 manual collections were carried out by an exhaustor in different habitats.
- To study the vertical distribution of collembola in the soil was taken a series of samples of soil in the Ussuri Nature Reserve.
- The flotation method was used to compile faunistic material on the diversity of the collembola on the littoral of the Sea of Japan.
- Quantitative counts of earthworms were made in the oakery forest with hazel in the Sikhote-Alinsky Nature Reserve and in valley broad-leaf-cedar forest in the Ussuri Nature Reserve. A total 56 soil samples (10x10x15cm) were taken.
- Faunistic counts of earthworms were carried out in all surveyed forest types and additional route points were made in wet habitats (wetland, litter, deadwood).



## The map-scheme of trial areas and accounting points of collembola and earthworms



The orange marker indicates trial areas for quantitative accounting of the spatial distribution of the collembola (1-5) and earthworms (2, 5);  
Blue - the points of faunistic counts of collembola and earthworms.

# Field researchers



Accounting of collembola, seizure of samples by soil drill



Manual collection of collembola by an exhaustor



Manual sampling of litter and soil to account for earthworms



Preparation of samples for transportation



# Valley mixed forest

Primorsky Krai, Terneysky District, the surroundings of the Sikhote-Alin Nature Reserve, the valley of the river Brusnichnaya (the tributary of the Kema river)



Trees: *Pinus koraiensis*, *Abies nephrolepis*,  
*Populus maximowiczii*, *Picea jezoensis*,  
*Ulmus glabra*, *Betula alleghaniensis*



Undergrowth: *Actaea erythrocarpa*,  
*Philadelphus tenuifolius*, *Acer mono*,  
*Acer tegmentosum*


Herbal cover: *Carex campylorhina*,  
*Thalictrum filamentosum*, *Gálium* sp.,  
*Leptorumohra amurensis*, *Cimicifuga*  
*simplex*

Plant litter 2-3 cm, humus layer  
5-7 cm.




# Oakery forest with hazel

Primorsky Krai, Terneysky District, the Sikhote-Alin Nature Reserve,  
cordon Blagodatny




Trees: *Quercus mongolica*, *Betula platyphylla*;  
Undergrowth: *Corylus mandshurica* (the main species), *Tilia amurensis*, *Philadelphus tenuifolius*



Herbal cover: *Aruncus dioicus*,  
*Lespedeza bicolor*, *Carex* sp.,  
*Thalictrum* sp., *Rabdosia excisa* et all.



A unique phenomenon: collembolls on the underside of cap plate-shaped mushroom



Plant litter is well expressed: 3-5  
cm; humus layer 5-7 cm.



*E. nordenskioldi* – juvenile worm



# Valley mixed forest

Primorsky Krai, Chuguevsky District, the Upper-Ussuri station FSC.



Trees: *Pinus koraiensis*, *Abies nephrolepis*, *Picea jezoensis*, *Populus maximowiczii*, *Betula alleghaniensis*



Herbal cover: *Leptorumohra amurensis*, *Rubia cordifolia*, *Mitella nuda* et all.



Plant litter 2-3 cm,  
raw humus 5-7 cm.



Leaves of *Populus maximowiczii*



Undergrowth: *Philadelphus tenuifolius*,  
*Eleutherococcus senticosus*, *Acer mono*,  
*Lonicera chrysantha*.



# Valley broad-leaf-cedar forest

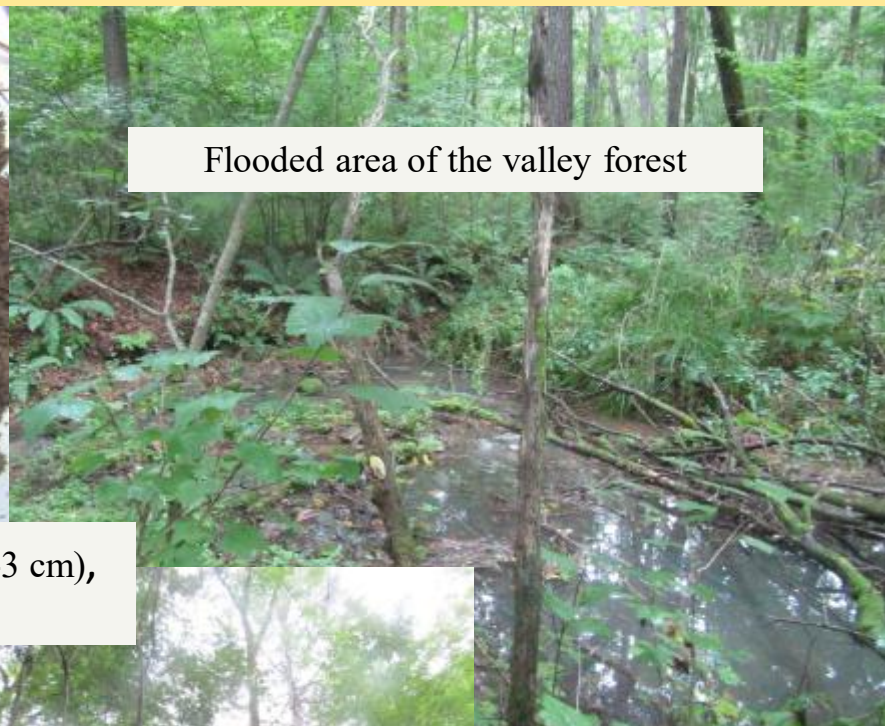
Primorsky Krai, Shkotovsky District, Ussuri Nature Reserve,  
the valley of the river Anikin



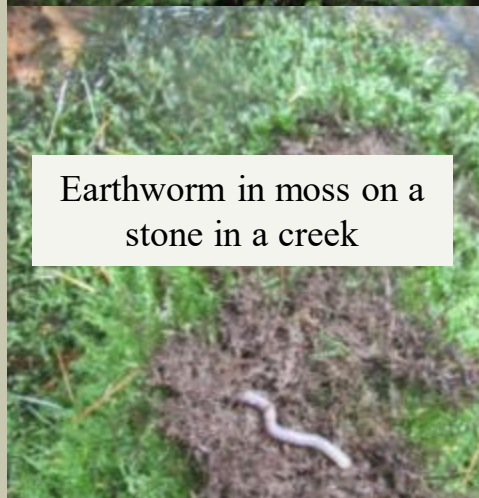
*Populus maximowiczii*  
in the tree layer



Plant litter is bad expressed (1-3 cm),  
humus layer 10-15 cm.



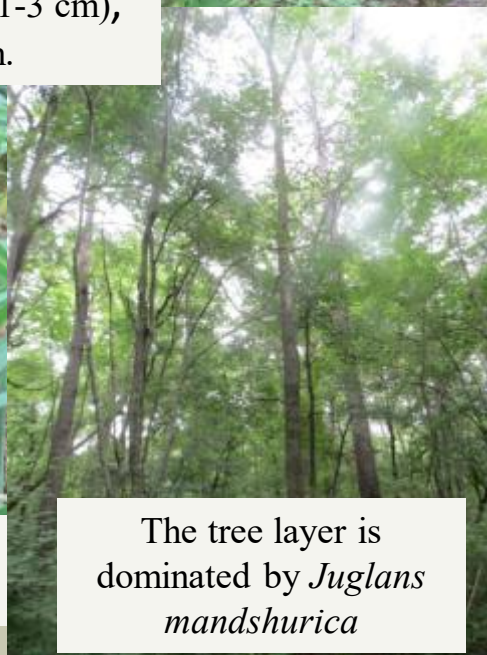
Flooded area of the valley forest



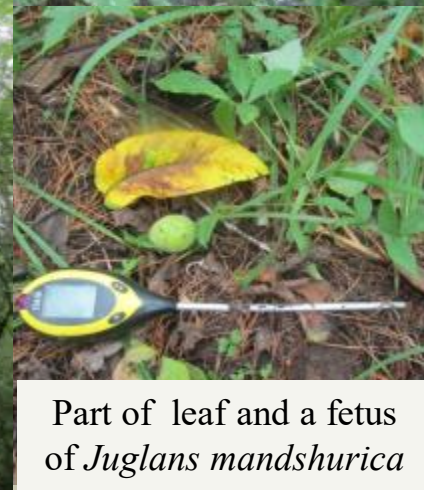
Earthworm in moss on a  
stone in a creek



*Carex siderosticta* in herbal  
cover



The tree layer is  
dominated by *Juglans*  
*mandshurica*



Part of leaf and a fetus  
of *Juglans mandshurica*



# Unique forests of Primorye Territory:

dark coniferous forests with evergreen *Rhododendron fauriei* and *Taxus cuspidata*  
(Primorsky Krai, the Sikhote-Alin Nature Reserve)



*Abies nephrolepis* with  
*Rhododendron fauriei*



Herbal cover: *Leptorumohra amurensis*, *Oxalis acetosella*, *Carex*, *Maianthemum bifolium*,  
*Clematium japonicum*



Photocamera traps for observations of  
phenology of *Rhododendron fauriei*.  
Monitoring is conducted by Bondarchuk S.N.



*Taxus cuspidata*  
(about 500 years)



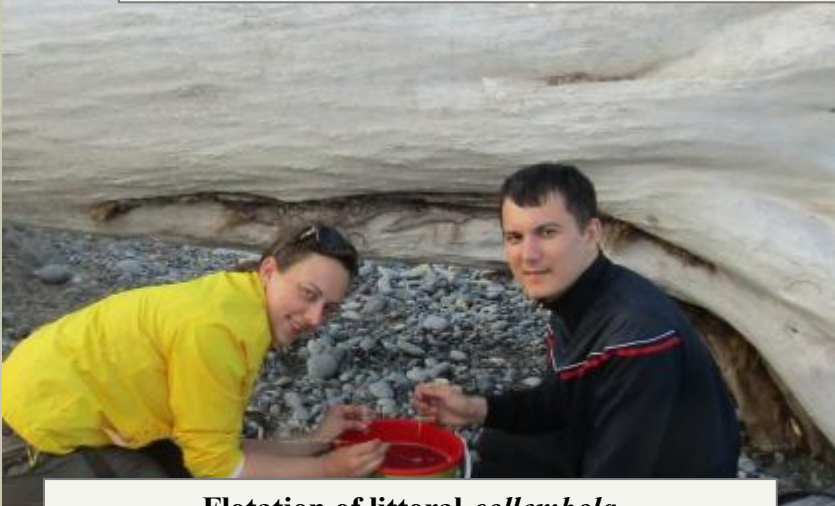
Renewal of *Rhododendron fauriei*  
on fallen tree trunks (sprouts in the litter often die)



# Life in the intertidal zone



Emissions of *Laminaria* on the coast of the Sea of Japan, Terneysky district



Flotation of littoral *collembola*



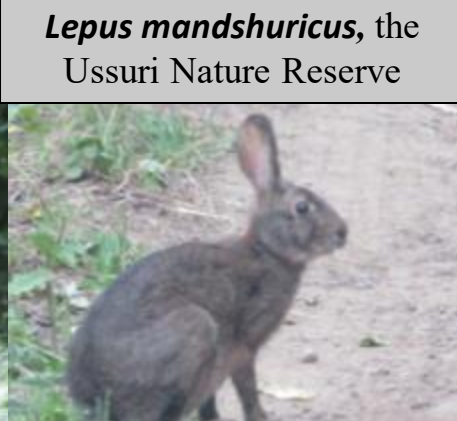
*Pectinidae*



# Animal world of Primorye Territory



***Cervus nippon***,  
the Ussuri Nature Reserve



***Lepus mandshuricus***, the  
Ussuri Nature Reserve



**Collembola** on mushrooms,  
the Sikhote-Alin Nature Reserve



***Heteroptera***, the Ussuri Nature  
Reserve



A juvenile **earthworm**,  
the Sikhote-Alin Nature Reserve



***Papilio maackii***,  
the Sikhote-Alin Nature Reserve



The **Tiger's** Footprint, the Ussuri  
Nature Reserve



# Rare plants and mushrooms of the Primorye Territory



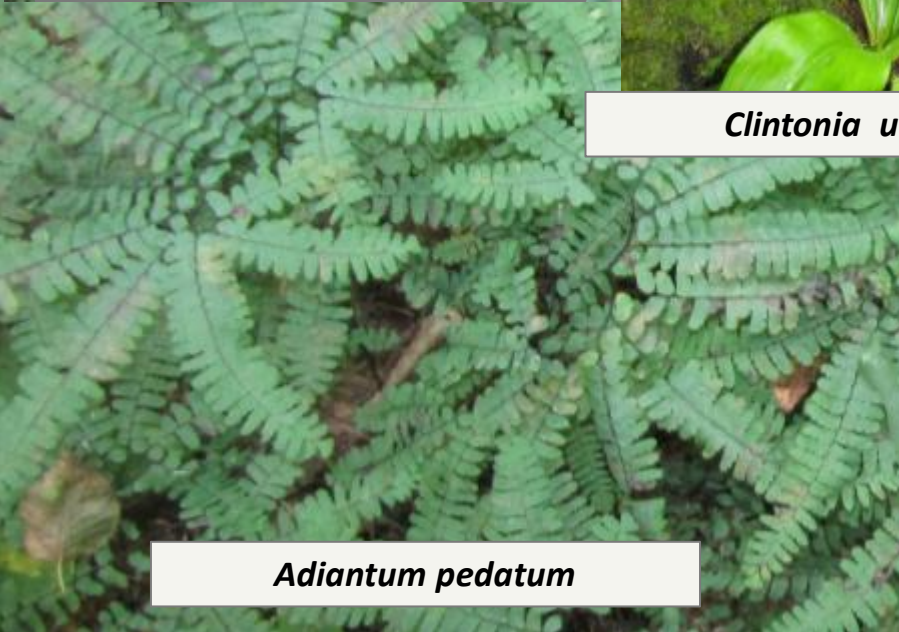
*Acer mandshuricum*



*Clintonia udensis*



*Nelumbo Komarovii*



*Adiantum pedatum*



*Geastrum quadrifidum*





**Consultations in geobotanical descriptions:** Bondarchuk S.N.

**Photographs:** Geraskina A., Naumenko R.

This work was supported by the Russian Foundation for Basic Research  
(project № 16-04-01228) – the head of the scientific project, professor Kuznetsova N.A.