

研究报告

## 森林和沼泽对溪流水化学特征的影响

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**摘要** 以小兴安岭北部公别拉河上游为研究区, 于2004年7~9月对森林溪流和沼泽溪流水样进行水化学特征对比分析. 结果表明, 森林和沼泽溪流水化学类型均为重碳酸盐类钙组 I 型水( $C^{Ca}_1$ ). 森林溪流水的pH、矿化度、总硬度、 $HCO_3^-$ 、 $SO_4^{2-}$ 、 $Ca^{2+}$ 、 $Mg^{2+}$ 、Fe均低于沼泽溪流, 而总氮、总磷、 $Cl^-$ 、 $K^+$ 、 $Na^+$ 则高于沼泽溪流. 森林溪流和沼泽溪流中重金属元素Fe、Mn、Cu、Zn、Cd、Hg和Pb含量较低, 均未超过我国 I 类地表水环境质量标准. 森林溪流中总氮含量为  $(0.27 \pm 0.04) \text{ mg} \cdot \text{L}^{-1}$ 、总磷含量为  $(0.040 \pm 0.005) \text{ mg} \cdot \text{L}^{-1}$ , 明显高于沼泽溪流中总氮含量  $(0.21 \pm 0.02) \text{ mg} \cdot \text{L}^{-1}$  和总磷含量  $(0.025 \pm 0.004) \text{ mg} \cdot \text{L}^{-1}$ , 沼泽湿地对N、P有较强的储存和吸附能力, 且对 $NH_4^+$ -N的吸附作用远大于对 $NO_3^-$ -N的吸附. 沼泽溪流中Fe含量为  $(0.26 \pm 0.05) \text{ mg} \cdot \text{L}^{-1}$ , 显著高于森林溪流Fe含量, 沼泽湿地对Fe起到还原释放作用.

**关键词** [公别拉河流域](#) [森林](#) [沼泽](#) [溪流](#) [水化学特征](#)

分类号

## Effects of forest and swamp on hydrochemical characteristics of streams

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### Abstract

With the upper reaches of Gongbiela River in the northeast part of Xiaoxing'an Mountains as test area, this paper studied the hydrochemical characteristics of the streams in forest and swamp during the period of June~September 2004. The results indicated that the hydrochemistry of forest and swamp streams belonged to calcium-bicarbonate type I ( $C^{Ca}_1$ ). The pH value, mineralization rate, total hardness, and  $HCO_3^-$ ,  $SO_4^{2-}$ ,  $Ca^{2+}$ ,  $Mg^{2+}$  and Fe concentrations of forest streams were lower than those of swamp streams, while the concentrations of total N, total P,  $Cl^-$ ,  $K^+$ , and  $Na^+$  were in adverse. In both of the streams, the contents of heavy metal elements such as Fe, Mn, Cu, Zn, Cd, Hg and Pb were lower than the class I in Environmental Quality Standards for Surface Water (EQSSW) of China. The concentrations of total N and P in forest streams were  $(0.27 \pm 0.04) \text{ mg} \cdot \text{L}^{-1}$  and  $(0.040 \pm 0.005) \text{ mg} \cdot \text{L}^{-1}$ , respectively, being significantly higher than those ( $(0.21 \pm 0.02) \text{ mg} \cdot \text{L}^{-1}$  and  $(0.025 \pm 0.004) \text{ mg} \cdot \text{L}^{-1}$ ) in swamp streams. Swamp wetland had a stronger ability in depositing and adsorbing N and P, with more  $NH_4^+$ -N adsorbed than  $NO_3^-$ -N, and also had a stronger ability on the reduction and release of Fe, with the Fe content ( $(0.26 \pm 0.05) \text{ mg} \cdot \text{L}^{-1}$ ) in its streams obviously higher than that in forest streams.

**Key words** [Gongbiela River basin](#) [Forest](#) [Swamp](#) [Stream](#) [Hydrochemical characteristics](#)

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