

Title: Cytogenetic investigations on *Fragaria* species native to Germany using Fluorescent *in-situ* Hybridization

Abstract

Hybridization of unreduced gametes in the genus *Fragaria* (Rosaceae) is important in the evolutionary growth of polyploidy series raised in wild strawberry species. *Fragaria* is additionally featured by hybridization between different species and polyploidy, with various ranges of ploidy levels from diploid ($2n = 2x = 14$) to decaploid ($2n = 10x = 70$). The genus also displays a broad range of sexual polymorphism in the gynodioecy pathway from hermaphroditism to dioecy and the way back; and it also includes diversity in either self-compatibility or self-incompatibility. This biological variety, assembled with the accessibility of genomic resources, provides *Fragaria* with a great appealing structure for ecological and evolutionary genomics. To study chromosomal characters of three European strawberry species (*F. vesca*, $2x$; *F. viridis*, $2x$ and *F. moschata*, $6x$) and their hybrids, I used rDNA FISH analysis with 5S and 18S probes, and the ancestry of *F. moschata* was examined by comparing chromosomal markers using rDNA FISH and/or Genomic *in situ* hybridization (GISH). These techniques allow for investigating the chromosomal evolution, or the genomes of natural and artificial hybrid plants. Root tip cells of diploid taxa were typified by two 5S and six 18S rDNA hybridization signals of varying intensities, providing a baseline for comparisons within the genus. In one exceptional diploid genotype, *F. viridis* (sample F.vi Niderau) with one 5S but six 18S rDNA sites were found. The numbers of 5S and 25S rDNA signals respectively were three and six in a diploid *F. ×bifera* sample. In hexaploid *F. moschata*, a proportional multiple of six 5S and 18 S rDNA sites was observed, but the number of 18S rDNA sites was two less than the proportionate prediction of eighteen in one sample of *F. moschata* (sample F.mo wal8). My GISH analysis indicated some separation signals of *F. viridis*, *F. vesca* and other unspecified genomes in hexaploid *F. moschata*. Thus, our results add justification to continued hexaploid exploration and evaluation in *Fragaria*.

Biography

Blaise Binama is a young conservation biologist who was born on 24th December 1993 in Goma, DRC. Currently he reside in Gasabo district, Kigali, Rwanda. He graduated in Botany and Conservation at the University of Rwanda (UR) in July, 2016. When he was a student at UR, he served as the president of Rwanda University Club for Conservation of Biodiversity (RUCCB) for two years. Directly after his graduation, he has shortly worked with CoEB as a volunteer. As a public speaker, he hold a certificate in Leadership and Public Speaking Skills awarded by Toastmasters International in late 2016. 2016-2017, he was the committee member for young scientists in Senckenberg Institutions, Germany and he is a member of British Ecological Society since 2016 until now. He recently received his Master's degree in Biodiversity and Collection Management at Technical University of Dresden/ IHI Zittau (2018). Subsequently, he has been trained in different aspects of global biodiversity by Natural Historical Museum of Goerlitz, Senckenberg.

