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POSSIBLE ASSOCIATIONS OF THE NOVEL DESCRIBED GARDNERELLA SPECIES AND VIRULENCE PROPERTIES

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Introduction: Bacterial vaginosis (BV) is the most common vaginal disorder worldwide in women of reproductive age. It is often characterized by the loss of normal vaginal flora, particularly *Lactobacillus* species, and overgrowth of anaerobes such as *Gardnerella*. While it has been previously shown that *Gardnerella* has significant higher virulence than most of the other cultivable BV associated species, it has also been found that many healthy women are colonized by *Gardnerella*. As such, there has been much debate in the literature concerning the contribution of *Gardnerella* to the etiology of BV. Very recently, whole genome sequence analysis

of 81 strains of *Gardnerella vaginalis* revealed that this 'species' is a genus, comprising 13 genomic groups, of which four were described as *G. vaginalis*, *G. leopoldii*, *G. piovii* and *G. swidsinskii*.

Goals: Here we hypothesize that the distinct *Gardnerella* species have different virulence potential and that this can explain why some *Gardnerella* are present in healthy women without developing BV.

Methods: *Gardnerella* isolates from healthy women and women with BV were identified by MALDI-TOF. All isolates were phenotypically characterized by: (i) determining their initial adhesion and (ii) cytotoxicity to HeLa epithelial cells, (iii) their ability to displace *L. crispatus* previously adhered to HeLa cells and (iv) their ability to form biofilms in sBHI growth media.

Results: *G. vaginalis* was the most prevalent species in this pilot study followed by *G. piovii*, *G. leopoldii* and finally *G. swidsinskii*. In the group of isolates with Nugent score ≥ 7 , we observed a higher heterogeneity of *Gardnerella* species. Interestingly, *G. piovii* and *G. leopoldii* were able to adhere to HeLa cells in higher concentrations. Furthermore, the ability to displace pre-adhered *L. crispatus* was significantly higher with *G. leopoldii* while *G. swidsinskii* was not able to remove any *L. crispatus*. There was substantial variability in the cytotoxicity score, with *G. leopoldii* being most consistently the more cytotoxic of species tested. Finally, no differences were observed in the species abilities to grow as biofilms.

Discussion/conclusions: Overall, *G. leopoldii* presented higher virulent traits, followed by *G. piovii* and then *G. vaginalis*, while *G. swidsinskii* had lower virulence potential. These differences might explain colonization by *Gardnerella* in healthy women. However, these results need to be further validated using a higher number of isolates.