

# Psoriasis and the gut microbiome: a scoping review

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## Background

- Psoriasis is considered as a systemic inflammatory disease rather than merely a skin disease.
- A potential role for the gut microbiome as a trigger for systemic inflammation has been hypothesized.
- Available literature suggests that psoriasis patients have an altered gut microbiome compared to healthy controls.

## Objectives

This study aims to investigate:

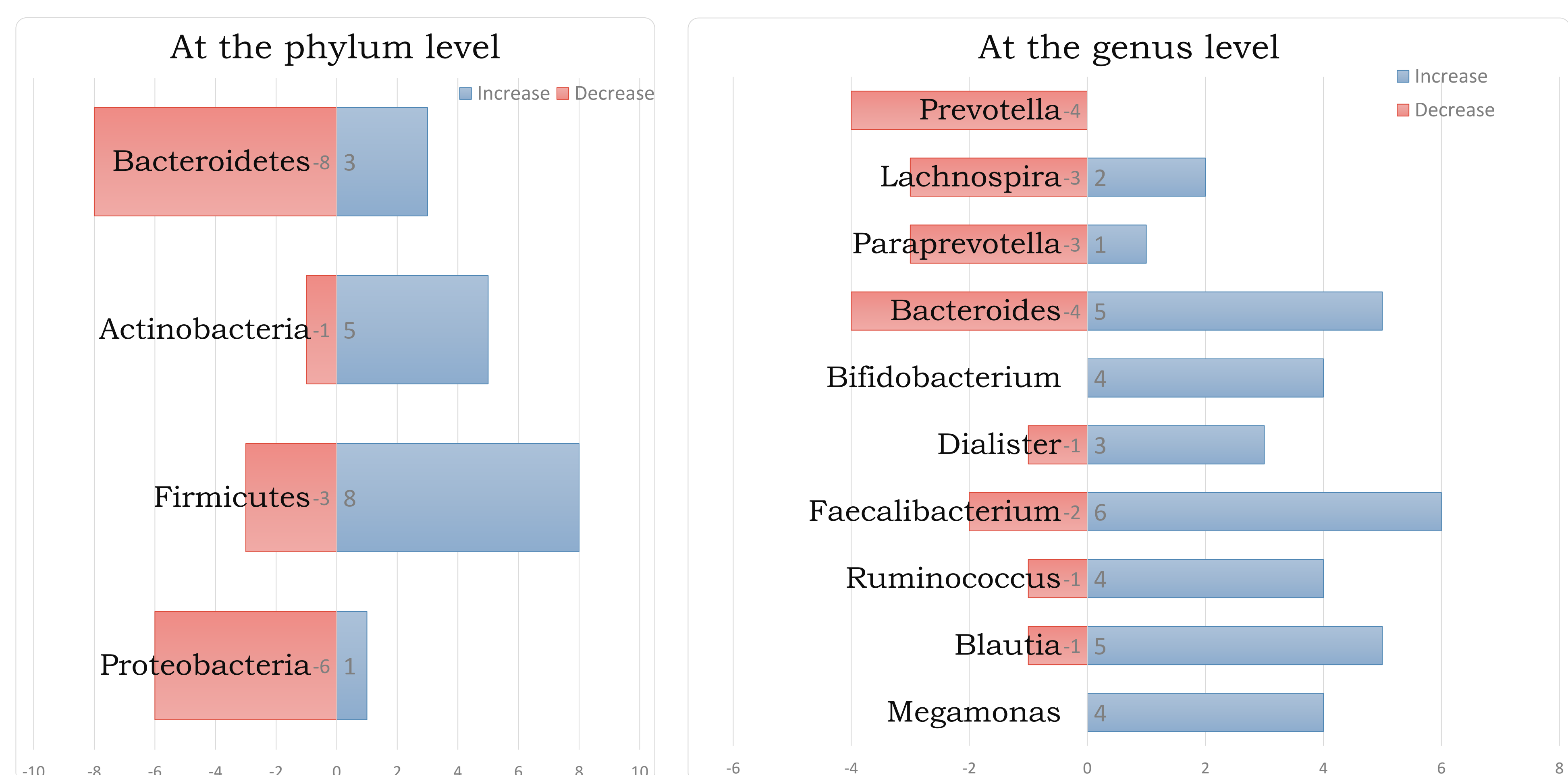
- potential differences in the gut microbiome in psoriasis patients compared to healthy controls.
- potential effects of psoriasis treatments on the gut microbiome.
- potential effect of probiotics on psoriasis lesions.

## Methods

The scoping review followed the PRISMA\*-guidelines. A systematic search of 5 electronic databases retrieved 1546 original papers. The remaining articles were selected for inclusion in two rounds. In the first round two researchers (OL and PW) independently screened the studies based on title and abstract. In case of disagreement the two researchers discussed the article until consensus was reached or a third reviewer (TH) was consulted. In the second round the full text articles were read by one researcher (OL). In total 89 articles were included. Data were extracted from the articles and collected in Excel.

## Results

### 1. The gut microbiome in psoriasis vs healthy controls

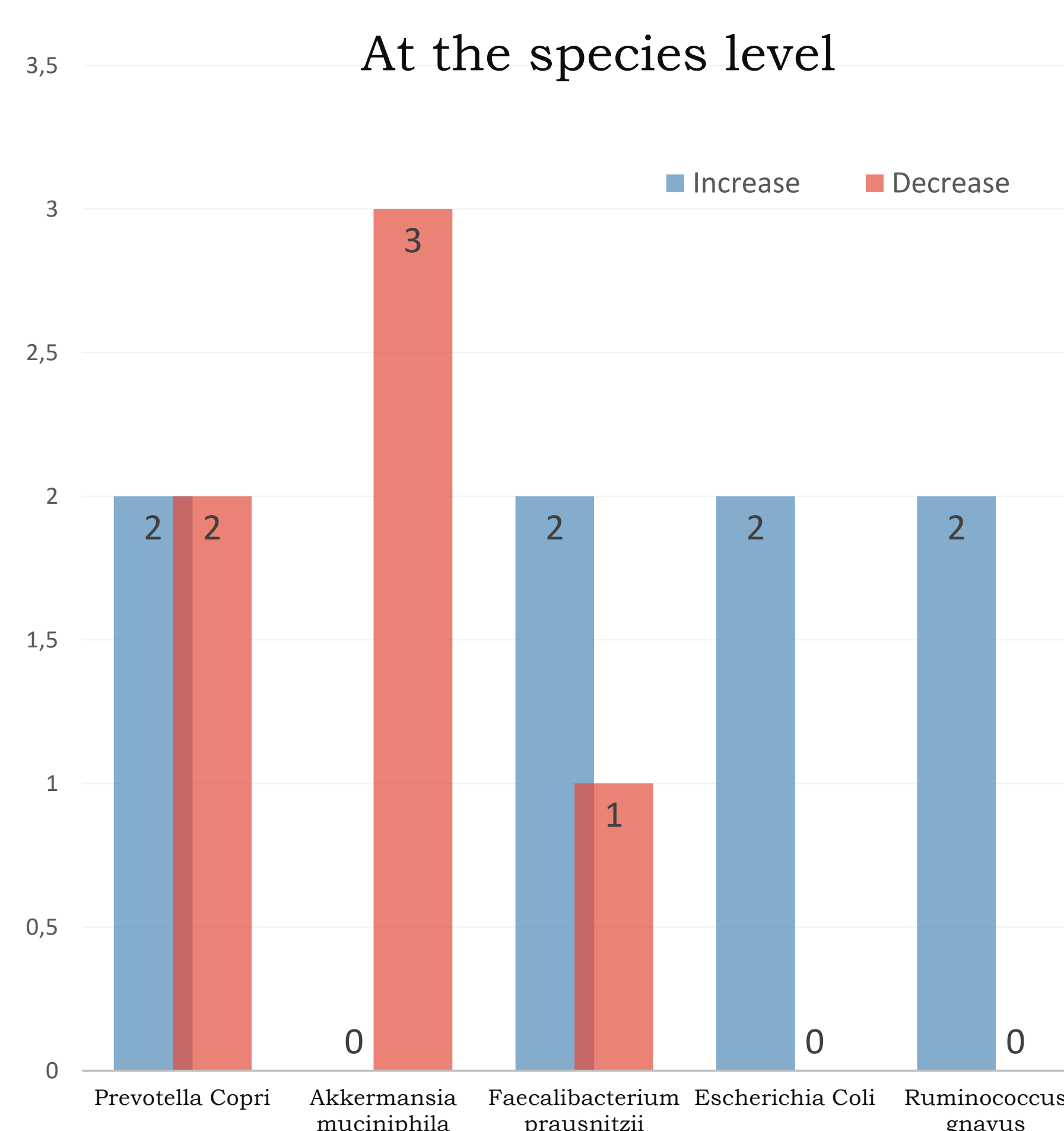


The figures depict significant alterations in the relative abundance of gut microbiota among psoriasis patients compared to control subjects. Data from 23 original reviews were used, only articles reporting significant findings concerning specific bacterial species were included in the analysis. Blue columns indicate increased abundance, while red columns represent decreased abundance.

**Figure 1:** Firmicutes exhibited a significant increase in 8 articles, whereas Bacteroidetes showed a decrease in those same articles. Actinobacteria generally exhibited increased abundance, whereas Proteobacteria tended to decrease.

**Figure 2:** Examination at the genus level highlighted the top ten most frequently altered bacteria. In numerous studies, Faecalibacterium, Blautia, Ruminococcus, Dialister, Megamonas, and Bifidobacterium demonstrated increased abundance, whereas Prevootella and Paraprevotella seemed decreased. Contradictory findings were observed in several articles regarding Bacteroides and Lachnospira.

**Figure 3:** Analysis at the species level revealed increases in Escherichia coli, Faecalibacterium prausnitzii, and Ruminococcus gnavus, each reported in 2 articles. Akkermansia muciniphila showed a decrease in abundance in 3 articles, while Prevootella Copri showed contradictory findings across four articles.



### 2. Impact of psoriasis therapy on the gut microbiome

- Three studies reported alterations of the gut microbiome following systemic therapy, while another three studies found no significant differences.
- Four studies identified distinct gut microbiome profiles between responders and non-responders to systemic therapy.

### 3. Probiotics in the treatment of psoriasis

- Among eight studies, seven found either an improvement of the lesions or a significant reduction in PASI\* scores when probiotics were used as an adjuvant treatment.
- None of the studies reported severe side effects associated with probiotic use.

## Discussion

- The F/B\* ratio, crucial for intestinal balance, appears disrupted in psoriasis patients.
- Psoriasis patients exhibit microbiome changes similar to those observed in inflammatory bowel diseases.
- Probiotics appear safe to administer and could have a potential as an adjuvant treatment in psoriasis.

## Conclusion

- There is a trend towards an increased F/B ratio in psoriasis patients.
- Although a distinct psoriatic core microbiome has been identified, there is no consensus on its composition.
- The gut microbiome holds promise as an indicator and predictor of systemic therapy response.
- Further research in larger cohorts is needed to determine whether these microbiome alterations are causative or consequential in the onset of psoriasis.
- Targets for the utilization of probiotics as adjuvant treatment in psoriasis management need to be identified.