Table S1. Literature review of studies focusing on the effect of fixed orthodontic appliances on oral microbiota, which were not included in the meta-analysis by Guo et al., 2017

Population N Mean/median age in years Type of sample PI/GI	T* (time of the sample collection)	Oral bacteria	Oral candida	Reference
30 patients Age: 12 – 18 years Stimulated saliva samples	T0 = 0 T1 = 4 weeks T2 = 12 weeks	All samples were positive for *Neisseria* sp. Following changes were observed, but they were NS. *S. mitis/oralis* increased at T1, but decrease almost to the initial levels at T2 *S. anginosus* – a slight decrease at T1 *S. mutans* – decrease at T1 *S. salivarius* increased a bit at T2 *S. sanguinis* decrease at both times, T1 and T2 *S. parasanguinis* decrease at T1 and increase at T2 Coagulase – negative staphylococci decrease at T1 but increase at T2 *Staphylococcus aureus* decrease at T1 and T2	All samples were negative for *Candida albicans*.	(28)
17 patients Age: 11 – 30 years Oral rinses	T0 = 0 T1 = 2 weeks T2 = 6 weeks T3 = 12 weeks	NA	Increase of number of the colony forming units of the *Candida* sp. during orthodontic treatment (NS) Dominance of *C. albicans*	(11)
124 patients Mean age 19.5 years	T0 = 0 T1 = 1 month T2 = 6 months	NA	NS difference in the presence of *C. albicans* during treatment by an orthodontic appliance.	(17)

Oral swab	T3 = 1 year after treatment T4 = 6 months after completion of ortho. treatment			
50 patients (case/control) Age: 14 – 23 years Oral swabs No statistically significant difference in PI in the group treated with fixed appliances	T = NA	Isolation of various *Streptococci* and *Enterococci* in patients treated with fixed appliances Low prevalence of live protozoans: *Trichomonas tenax* and *Entamoeba gingivalis* Detection of *Acanthamoeba* sp. cyst in several patients treated with fixed appliances	Correlation between the duration of treatment by fixed appliances and frequency of *Candida* sp. Presence of *C. albicans* correlates with poor oral hygiene	(8)
15 patients Age: 11 – 41 years Nonstimulated saliva samples No statistically significant difference in PI and GI	T0 = 0 T1 = 30 days T2 = 60 days T3 = 90 days	Purple complex was significantly decreasing from T2 Green complex was at the lowest level at T3 Yellow and orange complexes decreased significantly only at T3 Red complex decreased significantly at T2 and the lowest value was at T3	*Candida* sp. decreased significantly at T2 and the lowest value was at T3	(19)
90 patients Mean age 20.6 ± 7.1 years Oral swabs	T = NA	NA	Fixed orthodontic appliances did not enhance colonization of *Candida* sp.	(16)
75 patients (3 groups, (good oral	T0#^{GOH} = 14.9 ± 7.9 months	*S. mutans* and *Lactobacilli* were detected in all patients	73.4% of the patients were positive for *Candida* sp. in	(9)

hygiene – GOH, poor oral hygiene (POH, POH and white spot lesion – POH/WSL, 25 patients per group) Mean age 14.4 ±1.5 years Stimulated saliva and plaque samples	$T0\#^{POH} = 13.4 \pm 6.7$ months $T0\#^{POH/WSL} = 19.6 \pm 11.3$ months	Higher prevalence of *S. mutans* in patients with poor oral hygiene (NS) Higher prevalence of *Lactobacili*. A significant difference was observed between the GOH and POH/WSL groups	saliva and 60.9 % in dental plaque. Significantly lower prevalence of *Candida* sp. in GOH than in POH and in POH/WSL was observed.	
30 patients Age: 12 – 18 years Saliva sample	T0 = 0 T1 = 6 weeks T2 = 12 weeks T3 = 18 weeks	Significant increase of *S. mutans* and *Lactobacillus acidophilus* in T1 and continued up to T2 was observed	Total count of *Candida* sp. *increased* significantly during treatment by orthodontic appliances (starting from T1). *C. albicans* was the most predominant.	(29)
50 patients Age 10 - 18 years Samples via gargle method	T= 1,2,3,6 months before and after the beginning of treatment	NA	Significant increase of *Candida* sp. within 3 months after the installation of the orthodontic appliance	(18)
60 patients Age: 13 – 18 years Plaque samples	T0 = 0 T1 = 2 months T2 = 3 months	A dramatic increase of *S. mutans* at T1 and T2	Increase of *Candida* sp. at T1 and T2	(5)
60 patients (28 patients with fixed orthodontic appliance and 32 with removable appliance) Age: 4 – 10 years	T0 = 0 T1 = 6 months	NA	Significant increase of *Candida* at T1 in the group treated with fixed orthodontic appliance In the group treated with removable appliances, the increase of *Candida* was not significant At T0, the most frequently isolated species was *C. albicans*	(15)

Oral swabs			At T1, the most frequently found species was *C. tropicalis*	
95 patients (orthodontic group, 48 patients; control group, without appliances, 47 patients) Age: 12 - 16 years Stimulated saliva sample	T0 = 0 T1 = 6 months	Significant increase of *S. mutans* and *Lactobacillus* sp. at T1 in orthodontic group	NA	(10)
60 patients (orthodontic group, 30 patients; control group, without appliances, 30 patients) Age: 12 – 20 years Plaque samples Significant difference in PI in orthodontic and control subjects	T1 = 12.4 ± 6.2 months T2 = 3 years	Statistically significant greater prevalence of *Aggregatibacter actinomycetemcomitans* in the orthodontic group	NA	(13)

GI, gingival index; GOH, good oral hygiene; NA, not available; NS, non-significant; PI, plaque index; POH, poor oral hygiene; POH/WSL, poor oral hygiene and white spot lesion; ROA, removable orthodontic appliance; *T0, Before bonding of fixed orthodontic appliances; T1, T2, T3, After bonding of fixed orthodontic appliances

\# The mean wearing time at the time of samples collection; the orthodontic appliance was applied for a significantly longer time in the POH/WSL group than in other groups ($p = 0.017$)

Table S2. Correlations between the different taste preferences and changes in the oral environment of 30 patients

Deterioration of	PI	GI	percentage of 7 periodontal bacteria	percentage of 3 cariogenic bacteria	*Candida* sp.	*Candida* sp. and 7 periodontal bacteria
Favorite taste – sweet						
yes (n=13)	10 (77%)	7 (54%)	8 (62%)	6 (46%)	5 (39%)	10 (77%)
no (n=16)	8 (50%)	4 (25%)	8 (50%)	13 (81%)	0 (0%)	8 (50%)
p-value	0.249	0.143	0.711	0.064	**0.011**	0.249
Sweetening drinks						
yes (n=13)	8 (62%)	5 (39%)	6 (46%)	10 (77%)	3 (23%)	8 (62%)
no (n=17)	10 (59%)	6 (35%)	11 (65%)	10 (59%)	2 (12%)	11 (65%)
p-value	1.000	1.000	0.460	0.440	0.628	1.000
Alcoholic drinks						
yes (n=9)	5 (56%)	5 (56%)	5 (56%)	5 (56%)	1 (11%)	5 (56%)
no (n=21)	13 (62%)	6 (29%)	12 (57%)	15 (71%)	4 (19%)	14 (67%)
p-value	1.000	0.225	1.000	0.431	1.000	0.687
Energy drinks						
yes (n=9)	4 (44%)	1 (11%)	3 (33%)	8 (89%)	1 (11%)	4 (44%)
no (n=21)	14 (67%)	10 (48%)	14 (67%)	12 (57%)	4 (19%)	15 (71%)
p-value	0.418	0.100	0.123	0.204	1.000	0.225

GI, gingival index; PI, plaque index

Table S3. The percentages of 3 selected cariogenic and 7 periodontal bacteria relative to the total prokaryotic DNA at two time points – T0 (before bonding of fixed orthodontic appliances) and T1 (till the end of 7th month after bonding of fixed orthodontic appliances) in 30 patients

Selected bacteria	The difference in % of the total prokaryotic genome in GCF samples between T0 and T1 mean, median (5th, 95th PCTL)	*p*-value
Streptococcus mutans	0, 0 (-0.02, 0.01)	0.889
Lactobacillus sp.	0, 0 (-0.02, 0.01)	0.136
Actinomyces sp.	0.85, 0.44 (-1.10, 5.52)	**0.027**
All 3 cariogenic bacteria	0.84, 0.44 (-1.10, 5.45)	**0.030**
Aggregatibacter actinomycetemcomitans	-0.02, 0 (-0.04, 0.01)	0.866
Porphyromonas gingivalis	0, 0 (0, 0)	1.000
Tannarella forsythia	0, 0 (0, 0)	1.000
Treponema denticola	0, 0 (0, 0)	0.317
Parvimonas micra	0, 0 (0, 0)	0.317
Prevotella intermedia	0, 0 (0, 0)	0.314
Fusobacterium nucleatum	0.95, 0.13 (-2.98, 8.98)	0.339
All 7 periodontal bacteria	0.94, 0.13 (-2.98, 8.98)	0.329
All 10 bacteria	1.78, 0.47 (-2.04, 11.75)	0.086

T0, before bonding of fixed orthodontic appliances; GCF, gingival crevicular fluid; please note that when sampling GCF, dental plaque is sampled as well

p-value: The difference between T1 and T0 measurements is evaluated using the Wilcoxon matched-pairs signed-rank test.