Table 1: Diameters of the halos obtained for lactobacilli included into LAPTg and MRS agars and tested with antibiotics employed in ambulatory UTI treatment. TMS: trimethoprim-sulfamethoxazole (25 μg), CEC: cefaclor (30 μg), NOR: norfloxacin (10 μg), NAL: nalidixic acid (30 μg), PMD: pipemidic acid (20 μg), AMN: ampicillin (10 μg), CEF: cephalosporin (30 μg), NIT: nitrofurantoin (300 μg), AMS: aminopenicillin-sulbactam (20 μg). Note: commercial discs do not specify the type of cephalosporin employed.

Strain	*Antibiotic*									
	Media	SXT	CEC	NOR	NAL	PMD	AMP	CEP	NIT	AMS
CRL 1251	LAPTg	23/25	29/31	19/21	17/19	21/23	37/39	39/41	30/30	> 39
	MRS	> 40	> 40	31/33	25/27	30/30	> 40	> 40	> 40	> 40
CRL 1266	LAPTg	20/22	30/34	16/22	18/20	20/24	30/34	30/32	20–26	34–36
	MRS	> 28	> 30	21/23	19/21	17/19	40/40	> 30	> 30	> 28
CRL 1289	LAPTg	30/30	36/36	24/30	20/30	30/34	36/36	30/36	30/30	40/40
	MRS	> 34	> 34	33/35	29/31	29/31	33/35	27/29	21/23	40/40
CRL 1328	LAPTg	26/28	34/34	16/18	11/12	18/22	30/34	36/38	24/26	34734
	MRS	29/31	23/25	27/29	17/19	27/29	37/39	39/41	27/29	35/37

Table 2: Inhibition halos for *Staphylococcus aureus* ATCC29213 in LAPT and MRS agars compared to results published for NCCLS reference media using antibiotics for UTI treatment. SXT: trimethoprim-sulfamethoxazole, CEC: cefaclor, NOR: norfloxacin, NAL: nalidixic acid, PMD: pipemidic acid, AMP: ampicillin, CEP: cephalosporin, NIT: nitrofurantoin, SAM: aminopenicillin-sulbactam. Means of the diameters obtained in LAPTg and MRS agar from the assays performed by duplicate are shown. Note: commercial discs do not have the specification of the type of cephalosporin employed.

Halo diameter (mm)									
SAM	NIT	CEP	AMP	PMD	NAL	NOR	CEC	SXT	
18	20	18	10	21	22	22	26	14	LAPTg
24	34	28	16	24	14	32	36	38	MRS
29–37	18–22	27–31	27–35	NP	NP	17–28	29–37	24–32	Müller Hinton*

*Media recommended by NCCLS[1]. NP: data not published.

were of the same diameters to those obtained in Müller Hinton agar, it would suggest that the disc diffusion method could be performed in LAPTg or MRS with NCCLS reference strain. *S aureus* ATCC25922 was inoculated in LAPTg and MRS agar and the diameters of the halos obtained with antibiotic discs were compared to those of Müller Hinton. It was observed that *S aureus* ATCC25922 was able to grow on LAPTg and MRS agars. However, the diameters of the halos were different to those published by the NCCLS for Müller Hinton. The diameters obtained in a Müller Hinton, MRS, and LAPTg agar are shown in Table 2.

MICs

Considering that the six *Lactobacillus* strains were able to grow in LAPTg, this medium was selected to study the MICs. LAPTg agar or broth was employed and the obtained results are shown in Tables 3 and 4. All the tested lactobacilli were able to grow at elevated concentration of metronidazole (> 1000 μg/mL). They were also able to grow at high concentration of streptomycin (50–100 μg/mL), kanamycin (100–500 μg/mL), quinolones (norfloxacin, 250–1000 μg/mL, and ciprofloxacin, 10–100 μg/mL), chloramphenicol (250 μg/mL), cephalosporins (ceftriaxone, 100 μg/mL; ceftazidime,100 μg/mL), and aztreonam (100 μg/mL). For the other antibiotics assayed, the susceptibility depended on each particular strain. *L johnsonii* CRL1294 and *L paracasei* CRL1289 did not grow at concentrations of 1 μg/mL of novobiocin and vancomycin, but were able to grow at higher concentrations of almost all the other antibiotics (> 100 μg/mL). *L acidophilus* CRL1266 and *L salivarius* CRL1328 were able to grow at 10 and 1000 μg/mL of vancomycin, respectively.

DISCUSSION

In this paper, the antimicrobial susceptibility of six probiotic vaginal *Lactobacillus* strains was studied. The knowledge of the antimicrobial susceptibility or resistance is of interest to predict the behavior of an exogenously applied probiotic formula in patients subject to any type of chemotherapy, as well as to consider the concomitant use of the probiotic and antibiotics for the restoration of the normal urogenital flora. On the other side, antimicrobial susceptibility of exogenously applied microorganisms needs to be known for treating eventual collateral effects [19–22]. In this regard, the performance of antimicrobial susceptibility testing may be considered as both a necessary selection criterion for probiotic cultures and an effective guide for specific antimicrobial therapy [23].

Up to date, a standardized method to study the antimicrobial susceptibility of microorganisms belonging to the genus *Lactobacillus* has not been published, probably because