



Improving diagnostics of diarrheagenic *Escherichia coli* by use of a new **chromogenic** medium

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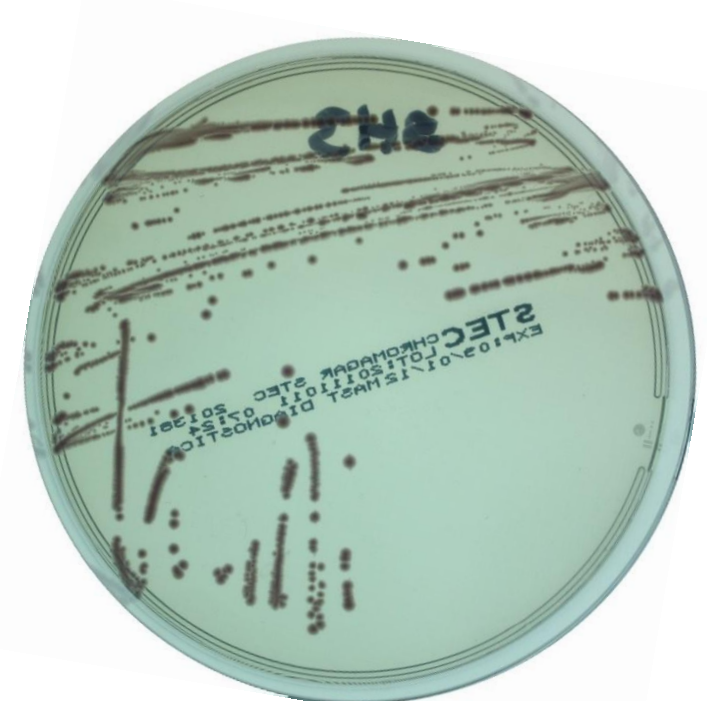
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Introduction

Diarrheagenic *E. coli* (DEC) are a common cause of diarrhoea in humans. They are heavily underdiagnosed in the routine laboratory due to the difficulty of differentiating them from *E. coli* of the commensal flora¹.

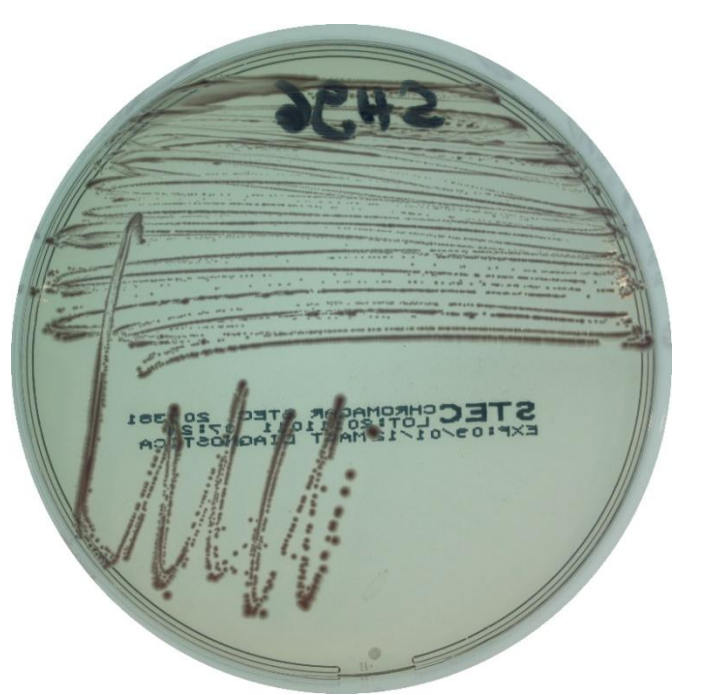
Therefore we tested a collection of *E. coli* of different pathotypes characterized as shown below by using a new selective chromogenic medium developed primarily for screening of shiga toxin-producing *E. coli* (STEC).



EHEC O26 on ChromAgar STEC



EHEC O103 on ChromAgar STEC



EAEC O126 on ChromAgar STEC



Other Enterobacteriaceae on ChromAgar STEC

Methods

145 *E. coli* strains previously serotyped² were screened for the presence of virulence markers of STEC, EPEC and Enteroaggregative *E. coli* (EAEC) by PCR (*eae*, *stx-1*, *stx-2*, *aggR*, *cvd432*, *east1* and *pic*). The adherence phenotype on Hep2 cells was also determined.

This yielded in 22 STEC, 47 EAEC, 21 EPEC and 55 *E. coli* harbouring none of the virulence factors tested for. These isolates were cultivated on ChromAgar STEC (Mast Diagnostica, Reinfeld) as by manufacturer's instructions.

pathovar	serogroup	growth	no growth
EHEC	O26	4	0
	O91	0	1
	O103	0	1
	O104	8	0
	O145	1	0
	O146	1	0
	O157	2	1
	OR	0	1
	unknown	0	2
EAEC	O44	0	2
	O55	1	1
	O78	1	0
	O86	2	6
	O91	0	2
	O103	0	1
	O111	0	4
	O114	0	1
	O125	0	4
	O126	6	4
	O127	1	2
	O128	2	5
	O142	0	1
	O145	0	1
EPEC	O26	4	6
	O103	0	1
	O119	0	1
	O127	1	0
	O145	0	2
	O157	0	6
other	O25	0	1
	O26	1	2
	O44	1	3
	O55	0	3
	O78	1	4
	O86	0	6
	O103	0	2
	O114	0	3
	O119	0	2
	O125	0	3
	O126	0	5
	O127	1	2
	O128	1	7
	O142	0	1
	O158	0	1
	unknown	0	5

Results

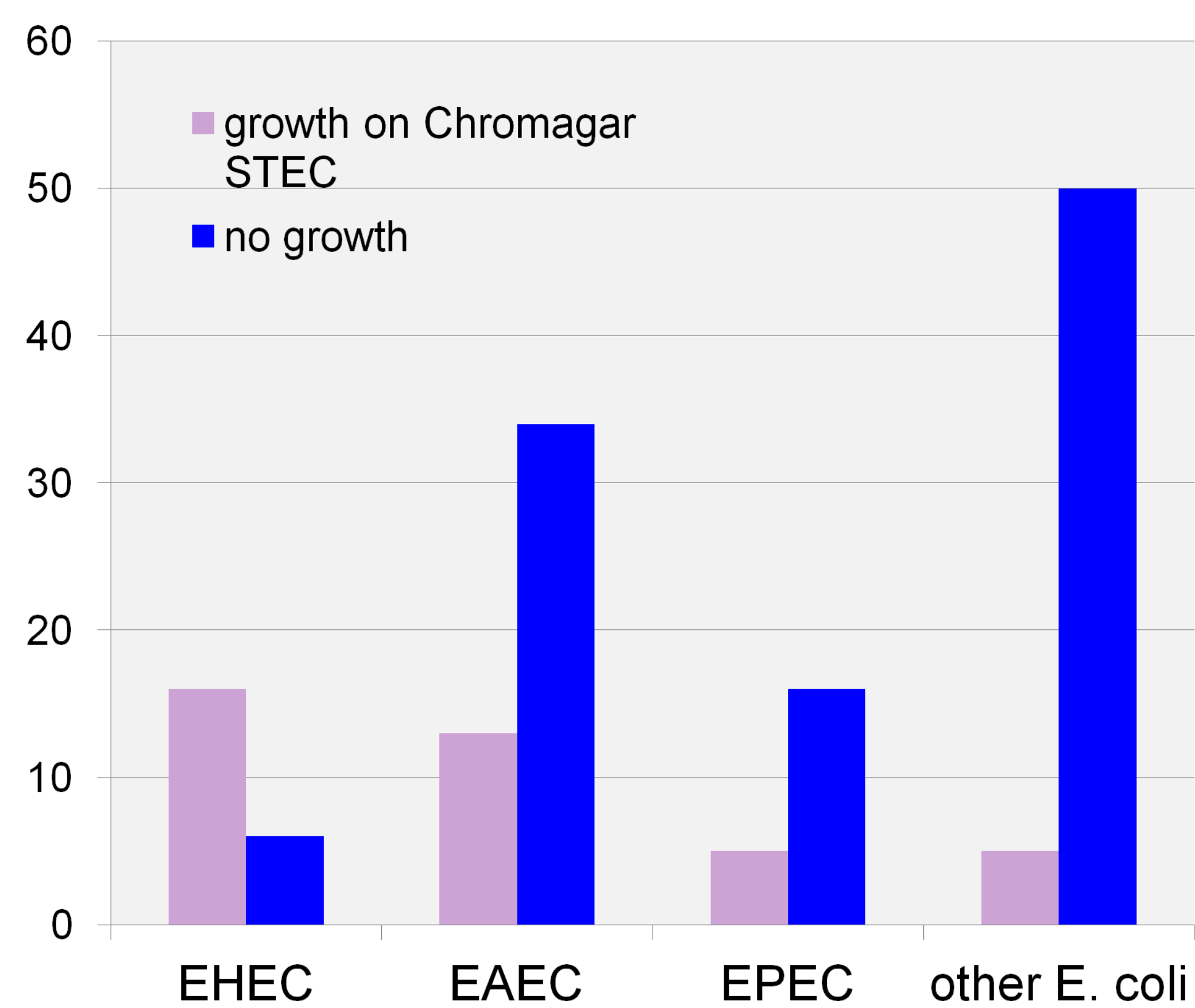


Figure 1: Growth of *E. coli* pathotypes on ChromAgar STEC

- 39 of 145 *E. coli* grew as mauve colonies
- 16 STEC (73%) displayed mauve colonies, among them serogroups O26, O104, O145 and O157
- 5 EPEC (24%) grew mauve on ChromAgar STEC, 4 of these belonging to serogroup O26
- 13 EAEC (28%) showed mauve colonies on ChromAgar STEC
- EPEC and EAEC of serogroups O145 and O157 were not able to grow
- 5 *E. coli* without known virulence factors (9%) showed growth on ChromAgar STEC

Conclusion

- ChromAgar STEC is a useful selective medium for the most prevalent STEC serotypes (O26, O104, O145, O157)
- Few STEC (serogroups O91 and O103) are suppressed in growth
- Some EAEC and EPEC strains also grow as mauve colonies
- ChromAgar STEC is a helpful tool for STEC screening and may support EAEC and EPEC diagnostics

The ChromAgar medium was provided by MAST Diagnostica. The authors do not have any conflicting interests.

¹Müller D et al. (2007): Identification of unconventional intestinal pathogenic *Escherichia coli* isolates expressing intermediate virulence factor profiles by using a novel single-step multiplex PCR. *Appl Environ Microbiol* 73, 3380-3390.

²Hauswaldt SI, Fickweiler K und Rodloff AC (2009): Enteropathogene *E. coli*: Epidemiologie in Sachsen und Evaluation diagnostischer Methoden. *Der Mikrobiologe* 19, 206-216.