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(// : // :)

% % . % / /

.and Hoseinpour, 2007)

.(Sample et al., 1980)

(Mengel and

/ /
.Kirkby, 1987)

:

.(Samadi, 2006)

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(R-COOH)

(

(Marschner,

.(Marschner, 1995)

.1995)

.(Marschner, 1995)

(Ma et al.,

.(Strobel, 2001)

.2009)

(Fox () :

.and Comerford, 1990)

(Citrate)

(Biabanaki

(Malate)

(Oxalate)

.(Fohse and Jungk, 1983)

)

(

(Banik and Dey,

()

.1983; Neuman et al., 1999)

Ca⁺² Fe⁺³ Al⁺³

Ca-P

Ca

pH (Gee and Bauder, 1986)

.(Jones and Darrah, 1994)

/ :

(2001) Lu et al.

(1934) Walkly and Black

(Rayment

(CCE)

% / /

(CEC)

and Higginson, 1992)

% / /

(Page et al., 1982)

(Olsen et al., 1954)

Fe

CaCO₃ Ca

Al

(1970) Nagarajah et al.

pH

.(Hu et al., 2001)

pH

pH

pH

pH

Costate MSTATC

/
Excel

/

/ (KCl)

) (KH₂PO₄)

() () (

%

/

(/)

rpm

/

pH

(/)

(Murphy and Riley, 1962)

pH

	CEC	OC	*CCE	pH	
mg kg ⁻¹	cmol _c kg ⁻¹	%			
		/	/	/	vertic endoaquepts S ₁
		/	/	/	typic calcixerepts S ₂
		/		/	typic calcixerepts S ₃
		/		/	vertic calcixerepts S ₄
		/	/	/	typic calcixerepts S ₅
			OC		CCE
					CEC*

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(2001) Lu et al. .

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≈ < < :

(Nagarajah et al., 1970; Eral et al., 1979)

. < < < :

/ a	/ a	/ a	/ a	/ a*
/ b	/ c	/ c	/ b	/ a
/ b	/ c	/ b	/ c	/ b
/ a	/ b	/ c	/ c	/ a
/	/	/	/	/

LSD_{0.05}*

(2001) Hu et al.

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×

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(Hu et

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.al., 2001)

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/ /

(Lu et al., 2001)

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(CV) ***

×

×

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)

(

(mg kg⁻¹)

/ A	/ f	/ a	/ b	/ b	/ b*		
/ B	/ fg	/ b	/ d	/ c	/ b		
/ C	/ g	/ d	/ d	/ e	/ d		
	/ D	/ A	/ C	/ C	/ B		
		()		()			

*

(mg kg⁻¹)

/ A	/ h	/ a	/ b	/ bc	/ h	/ a	
/ B	/ i	/ c	/ e	/ e	/ i	/ c	
/ C	/ i	/ d	/ g	/ f	/ i	/ d	
	/ D	/ A	/ C	/ B	/ A		
		()		()			

*

(mg kg⁻¹)

/ A	/ e	/ a	/ ab	/ b	/ b*		
/ B	/ ef	/ b	/ c	/ b	/ b		
/ C	/ f	/ cd	/ d	/ c	/ b		
	/ C	/ A	/ B	/ B	/ A		
		()		()			

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Fixen)

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(and Grove, 1990

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(White, 1981)

(Tisdale et al.,

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.1985)

(Hu et al., 2001)

(1979) Eral et al.

CCE

(2001) Hu et al.

CCE

Khademi et al.

(2009)

()

(Haynes

.and Swift, 1989; Prafitt, 1978)

(Cambier and Sposito,

.1991; Vioante and Gianfreda, 1995)

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