

0DULMXDQD 9LROHQFH DQG /DZ

1RUPDQ 6 0DQQHFKH2EHQEDUQVFKHLGW

6WXGLHV 6KRZ DQ \$VVRFLDWLRQ EHWZHHQ 0DULMXDQD DQG
0HQWDO RU 3K\VLFDQ &RQVHTXHQFHV

6WXGLHV VKRZ YLROHQFH DQG DJJUHVVLRQ ZLWK PDULMXDQD XVH

0DULMXDQD LQWR[LFDWLRQ UHVXOWV LQ SDQLF UHDFWLRQV DQG SDUDQRLG
IHHOLQJV ZKRVH V\PSWRPV V\PSWRPV V\PSWRPV V\PSWRPV @
RI FRQWURO DQG SDQLF LV DVVRFLDWHG ZLWK YLROHQFH > @ \$OVR
PDULMXDQD XVH LQFUHDVHV KHUW UDWK ZKLFK PD\ EH DVVRFLDWHG ZLWK
YLROHQW EHKDYLRXU > @

:KHQ SHRSOH VWRS XVLQJ PDULMXDQD WKH\ PD\ H[SHULHQFH D YDULHW\ RI
ZLWKGUDZDO V\PSWRPV LQFOXGLQJ VOHHS GLVWXUEDQFH LUULWDELOLW\ RU
UHVWOHVQHVV ORVV RI DSSHVLWH DQ[LHW\ DQG VZHDWLQJ > @
([SHULHQFLQJ DQ\ RI WKHVH V\PSWRPV FDQ PDNH D SHUVRQ DQJU\ UDQJLQJ
IURP PLOG LUULWDWLRQ WR YLROHQW UDJH 0DULMXDQD ZLWKGUDZDO FDQ OHG
LQWLPLGDWLQJ YLROHQW RU EXOO\LQJ EHKDYLRU HQGDQJHULQJ WKH SHUSHWUD
RU RWKHU SHRSOH DQG SURSHUW\ > @

,Q LQFDUFHUDWHG VXEMHFWV VWXGLHV IRXQG WKDW RQH WKLUG RI WKH VXEMH
WKDW FRPPLWWHG KRPLFLGH KDG XVHG PDULMXDQD WZHQW\ IRXU KRXUV
EHIRUH WKH KRPLFLGH)XUWKHU Wkuhh TXDUWHUV RI WKRVH VXEMHFWV ZHUH

2VDP ELQ /DGH QDUDQRLD 3V\FKRVLV

7DEON PDULMXDQD XVHV DQG V\PSWRPV

'LVFXVVLQR

:H DSSO\ WKH UHVXOWV RI WKH UHVHDUFK UHJDUGLQJ WKH UROH RI PDULMXDQD
LQ YLROHQFH :H XVH FRQFHSWV VXFK DV SHUVRQDOLW\ FKDQJHV SHUSHWUDWR
YLROHQFH DQG SV\FKRVLV WR HWDEOLVK RXU DVVRFLDWLRQ RI PDULMXDQD ZL
WKH XQIRUWXQD SWUSFWHMLV WR LOOXVWUDWH QHJDWLYH EXW
SUHYHQWDEOH WUDJLF RXWFRPHV GXH WR PDULMXDQD DQG LWV UROH LQ YLROH
H RYHUDOO REMHFWLYH LV WR LGHQWLI\ WKH UROH RI PDULMXDQD DQG WR VXJJ
LW LV DYRLGDDEOH DQG FDXVDO QDWXUH LQ LQGXFLLQJ YLROHQFH > @
,Q DOO WKH FDVHV VHOHFWHG PDULMXDQD XVH ZDV SUHVHQW)RU VRPH RI WK
LQGLYLGXDOV PDULMXDQD XVH ZDV

3V\FKRVLV &KDUW

H UHYLHZ GRHV QRW SURYH D FDXVDO UHVHVDVRSUHWKVS EHWZHHQDRIBBUOXDQD 0
DQG YLROHQFH LQ WKHVH FDVHV 5DWKHUFLXWFKVWDEOLVKHV D KLJKO\ GRFXPHQV
DVVRFLDWLRQ EHWZHHQ PDULMXDQD DQG YLROHQFHJRJSDSHUBO2VWPDQGLQ/GRHGH I
FDXVDWLRQ FDQ EH DSSOLHG WR LOOXVWUDWHWKWGLWRDVSFRVWDLRQ1<\$'OFRIDQVFD
fEXW IRUG WKH DFWLRQV RU FLUFXPVWDQFHLMXWGLWQHFRQDZFRKUGLQFRWDXDYA
RFFXUUHG \$ SUR[LPDWH FDXVH LV WKH UHVHVDVRSUHWKVS EHWZHHQDRIBBUOXDQD 0
WKH IDFWV DQPRDVFWRQV\ OHJDO DQG YLROHQFHJRJSDSHUBO2VWPDQGLQ/GRHGH I
YLROHQFH LQ WKHVH FDVHV ZDV WKH XVH DQG LQWR[LFDWLRQ IURP PDULMXDQD
1R RWKHU XDVH EHWZHHQ UHTXLUHPHQWV

&RQFOXVLRQ

\$FFRUGLQJ WR UHVHDFK VWXGLHV PDULMXDQD XVH FDXVHV DJJUHVVLYH
EHKDYLURU FDXVHV RU H[DFHUEDWHV SV\FKRVLV DQG SURGXFH SDUDQRLDV
HVHDFKWHV EHHQ LOOXVWUDWHG WKURXJK FDVH VWXGLHV RI KLJKO\
SXEOLFLJHG LQFLGHQWVSDRPHMLJKWHQHG SROLWLFDO

HVFDVHV FRQWDLQ H[DPHSHV RI UHSHDWHG LOOXVWUDWLRQV RI DJJUHVVLRQ
SV\FKRVLV DQG SDUDQRLD E\ PDULMXDQD XVHUV DQG LQWR[LFDWLRQ
8OWLPDWHO\ ZLWKRXW WKH XVH DQG LQWR[LFDWLRQ RI PDULMXDQD WKH SRRU
MXGJPHQW DQG PLVSHUFHSWLRQV GLVSOD\HG E\ WKHVH LQGLYLGXDOV ZRXOG QR
KDYH EHHQ SUHVHQW UHGXFQJ WKH ULVN IRU DFWLRQV WKDW UHVXOW LQ VHQV
GHDWKV

,PSRUW WR WKHVH DVVHUVLRQV LV WKDW WKH FXUUHQW PDULMXDQD LV IDU P
SRWHQW LQ 7+& FRQFHQWUDWLRQV WKH SV\FKRDFWLYH FRPSRQHQW
\$FFRUGLQJO\ DQG GHPRQVUDWHG LQ GLUHFV VWXGLHV PRUH SRWHQW
PDULMXDQD UHVXOWV LQ D JUHDWHU ULVN IRU SDUDQRLG WKLQNQJ DQG SV\FKR
,Q WXUQ SDUDQRLG EHKDYLURU LQFUHDVHV WKH ULVN IRU SDUDQRLG EHKDYLURU
DQG SUHGLFWDEO\ DVVRFLDWHG ZLWK DJJUHVVLYH DQG YLROHQW EHKDYLURV

0DULMXDQD XVH FDXVHV YLROHQW EHKDYLURU WKURXJK LQFUHDVHG
DJJUHVVLYHQHV SDUDQRLD DQG SHUVRQDOLW\ FKDQJHV PRUH VXVSLFLRXV
DJJUHVVLYH DQG DQJHU

5HFHQW LOOLFLW DQG fPHGLFDO PDULMXDQDg HVSHFLDOO\ JURZQ E\ FDUH
JLYHUV IRU PHGLFDO PDULMXDQD LV RI PXFK KLJK SRWHQF\ DQG PRUH OLNHO\
WR FDXVH YLROHQW EHKDYLURU

0DULMXDQD XVH DQGLWVODGGEHFRQVLGHUHG LQ FDVHV
RI DFWV RI YLROHQFH DV LWV UROH LV SURSHUO\ DVVLJQHG WR LWV KLJK DVVRFL

5HFRJQLJH WKDW KLJK SRWHQF\ PDULMXDQD LV D SUHGLFWDEOH DQG
SUHYHQWDEOH FDXVH RI WUDJLF YLROHQW FRQVHTXHGHV

5HIHUHQFHV

- H 1HZ <RUN 7LPHV :KDW KDSSHQHG LQ IHUJXVRQ"
- &11 7UD\YRQ PDUWLQ VKRRWLQJ IDVW IDFWV
- 3%6 1HZVKRXU &KLFDJR UROHNDVWDOO\ DSKLF YLGHRI
VKRRWLQJ \HDU ROG /DTXDQ OF'RQDOG
- /DQVLQJ VWDWH MRXUQDO WLPDWRSH RI IDWDO GHYHQ JXLOIRUG
- &11 :KDW ZH NQRZ GRQdW NQRZ DERXW)UHGGH *UD\DV GHDWK
\$GGLFWLRQ 0DULMXDQD DQG GULYLQJ LPSDLUPHQW
- 1DWLRQDO ,QVWLWXWH RQ 'UXJ \$EXVH 'UXJ IDFWV 'UXJJHG GULYLQJ
/LYH VFLHQFH 5LGLQJ KLJK 3RW VPRNLQJ GULYHUV HYDGH EORRG WHVWV
- 135 3ODQQHG SDUHQQKRRG VKRRWLQJ VXVSHFW 5REHUW /HZLV GHDU WR
DSSHU LQ FRXUW ORQGD\
- 1%& QHZV *XQPDQ NLOOV LQFOXGLQJ IDPLO\ WKHQ KLPVHOI LQ
0LVVRXUL VKRRWLQJ UDPSDJH
- H 1HZ <RUN 7LPHV -DUHG /HH /RXJKQHU
- &%6 QHZV 'JKRNKDU DQGLWVODGGEHFRQVLGHUHG LQ FDVHV
- %URWKHUV

*RRGPDQ - 3DFNDUE 00~XHGFH